



KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: December 4, 2015

To: Robert Galati, PE, City of Sherwood

cc: Garth Appanaitis, DKS

From: Marc Butorac, PE, Zachary Horowitz, and Marjorie Ludet

Project: Sherwood Multi-Family Development

Subject: Traffic Impact Analysis



Mercury Development proposes to construct an 82-unit apartment development immediately to the east of and adjacent to Sherwood Plaza, which is an existing single-story retail property. The proposed housing development includes 141 parking spaces and a sidewalk separating the retail and housing development.

FINDINGS

Based on the analysis herein, the following findings and recommendations are associated with the proposed development of the Sherwood apartment project:

Year 2015 Existing Conditions

- All of the study intersections operate acceptably during the weekday a.m. and p.m. peak hours.
- The intersection of SW Langer Drive/99W right-in/right-out access road exceeds the 90th percentile crash rate for similar intersections in Oregon. All five reported crashes during the three-year study period at this location involved an angle collision between a vehicle that crossed SW Langer Road in either the northbound or southbound direction with a vehicle that traveled east or west on SW Langer Road. Two of the reported crashes involved minor injuries and three reported crashes had property damage only.
- The intersection at SW Baler Way/SW Tualatin-Sherwood Road is identified in the 2011-2013 Washington County SPIS List.

Year 2016 Background Traffic Conditions

- The year 2016 background traffic volumes were developed by applying a 1.5 percent annual growth rate to the existing volumes during the weekday a.m. and p.m. peak hours and by adding the trips generated by the in-process developments. Some trips were rerouted to take into account the modification in the lane configuration and traffic control at the intersection of SW Tualatin-Sherwood Road/Theater access road.

- During the year 2016 weekday a.m. and p.m. peak hour background traffic conditions, all of the study intersections are forecast to operate acceptably during the weekday a.m. and p.m. peak hours.

Proposed Development Plan

- The proposed development is estimated to generate approximately 545 net new weekday daily trips; including 42 trips (8 inbound, 34 outbound) during the weekday a.m. peak hour and 51 trips (33 inbound, 18 outbound) during the weekday p.m. peak hour.
- A trip distribution pattern for the proposed development was developed based on traffic count data collected as part of the traffic study.

Year 2016 Total Traffic Conditions

- Site-generated traffic was assigned to the study area roadways based on the assumed trip distribution pattern.
- All of the study intersections are forecast to operate acceptably during the weekday a.m. and p.m. peak hours.
- The proposed development will not create impacts based on 95th percentile queues lengths.

Recommendations

The following are the recommendations as part of this proposed development.

- Shrubbery and landscaping, as well as above ground utilities and signage near the site access points should be located and maintained to ensure adequate sight distance.
- To control traffic speeds and interactions with infrequently loading vehicles, speed bump installations along the south and east side of Sherwood Plaza should be considered.
- A sidewalk facility should be provided between the site and SW Langer Drive to facilitate pedestrian movements to/from the proposed development.
- The intersections of SW Langer Drive/99W right-in/right-out and SW Baler Way/SW Tualatin-Sherwood Road should be monitored by the City of Sherwood for potential traffic control modifications, if the historical safety problems persist.

Additional details of the study methodology, findings, and recommendations are provided within this report.

INTRODUCTION

Mercury Development proposes to construct an 82-unit apartment development immediately to the east of and adjacent to Sherwood Plaza, which is an existing single-story retail property. The proposed housing development includes 141 parking spaces and a sidewalk separating the retail and housing development. The site location and overall vicinity are shown in **Figure 1**. A conceptual site plan is shown in **Figure 2**.

SCOPE OF THE REPORT

This analysis identifies the transportation-related impacts associated with the proposed Sherwood multi-family development and was prepared in accordance with City of Sherwood Development Code Section 16.106.080. The study intersections and scope of this project were developed with City of Sherwood and DKS staff. Operational analyses were performed at the following study intersections and driveways:

Study Intersections:

- SW Langer Drive/ SW Sherwood Boulevard
- SW Langer Drive/Driveway on the north side of Dutch Bros.
- SW Langer Drive/99W right-in right-out access road
- SW Langer Drive/Driveway west edge of site
- SW Langer Drive/SW Baler Way
- SW Tualatin-Sherwood Road/SW Baler Way
- SW Tualatin-Sherwood Road/Theater access

Study Analysis Periods:

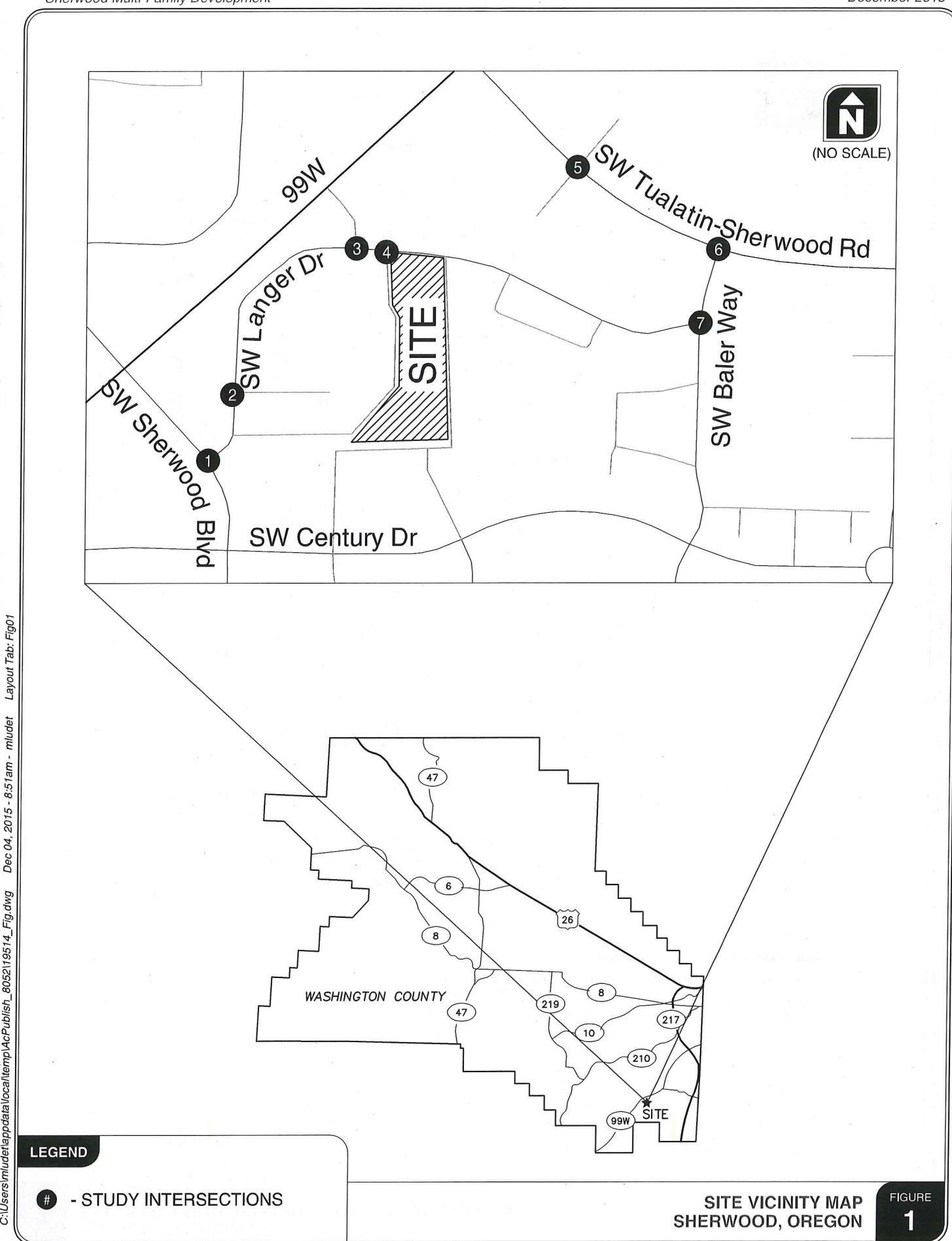
- Weekday a.m. peak hour
- Weekday p.m. peak hour

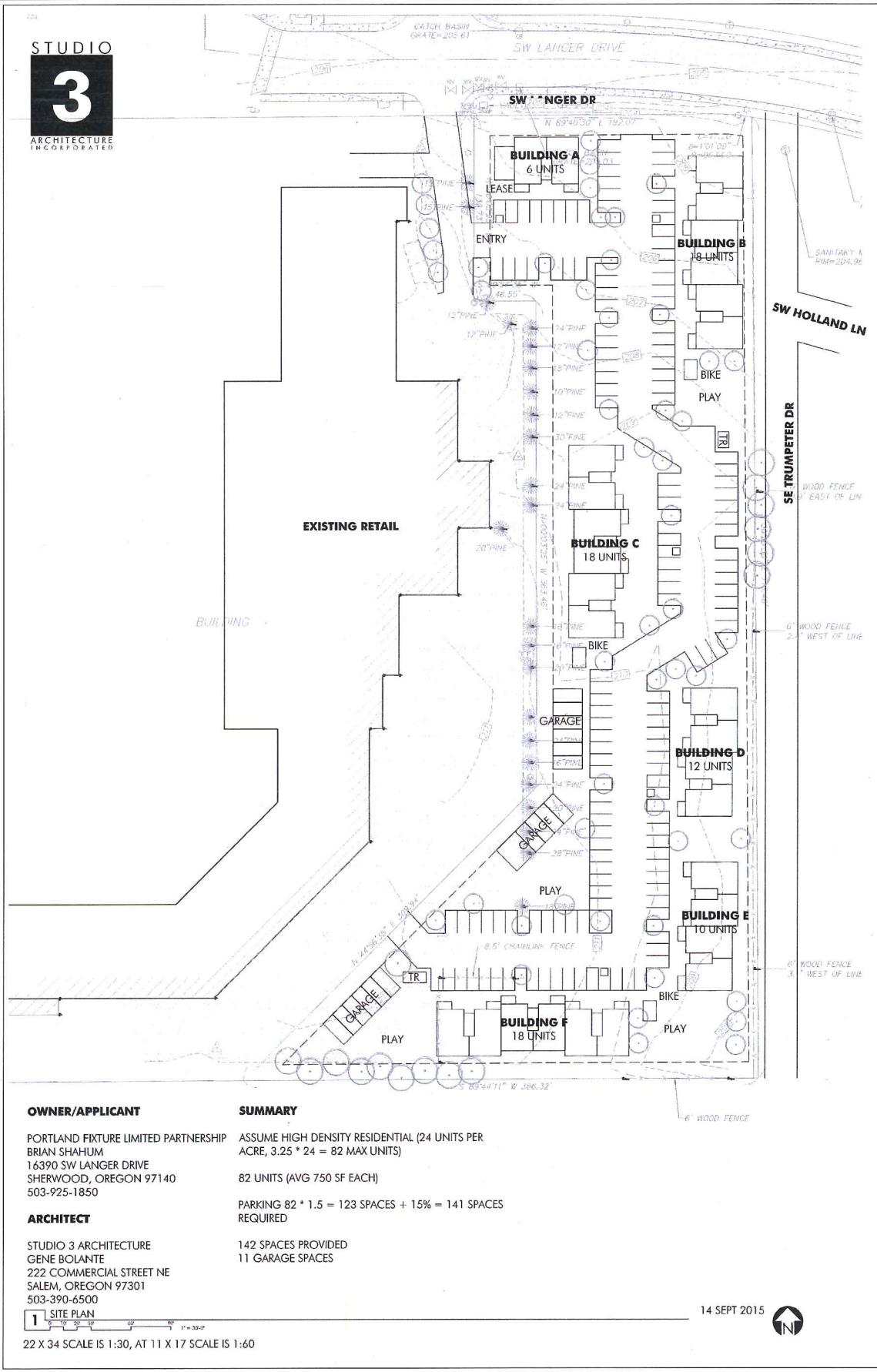
The analysis evaluates transportation conditions for the following scenarios:

- Year 2015 existing traffic conditions within the study area during the weekday a.m. and p.m. peak hours;
- Year 2016 background traffic conditions (without the proposed development) during the weekday a.m. and p.m. peak hours. This analysis includes rerouting traffic based on the removal of the traffic signal and conversion to right-in, right-out operations at the intersection of SW Tualatin-Sherwood Road/Theater access and the inclusion of in-process developments;
- Trip generation and distribution estimates for the proposed development;

- Year 2016 total traffic conditions (with full build-out of the proposed development) during the weekday a.m. and p.m. peak hours; and
- Intersection sight distance at the site access point on SW Langer Drive.

Appendix "A" contains the transportation scoping emails prepared for this analysis, with the jurisdictional responses.





PROPOSED SITE PLAN
PROVIDED BY STUDIO 3 ARCHITECTURE ON 09/14/15
SHERWOOD, OREGON

FIGURE
2

Figure 2: Proposed Site Plan



EXISTING CONDITIONS

This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed development, including an inventory of the existing multi-modal transportation facilities, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent crash history.

The site vicinity was visited and inventoried in November 2015. At that time, site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area were collected.

SITE CONDITIONS AND ADJACENT LAND USES

The proposed site is located within the City of Sherwood, and is currently vacant and zoned as a High Density Residential Planned Urban Development (PUD). The land uses in the vicinity of the site include a combination of retail and commercial properties, single- and multi-family residential homes, and open space.

TRANSPORTATION FACILITIES

A summary of the study area roadway characteristics is shown in **Table 1**.

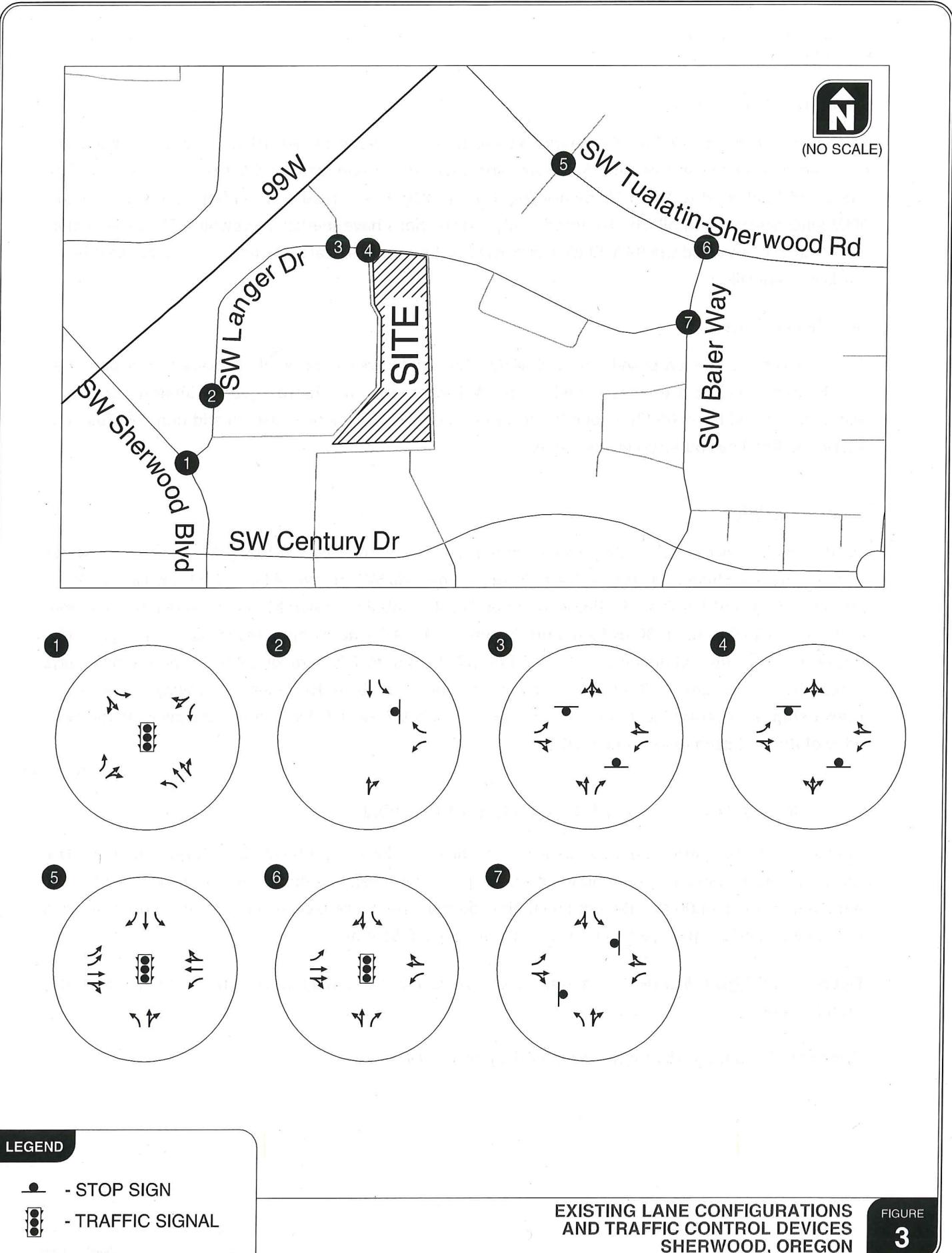
Table 1. Existing Transportation Facilities

Roadway	Functional Classification ¹	Number of Lanes	Posted Speed (mph ²)	Sidewalks	Bicycle Lanes	On-Street Parking
SW Sherwood Boulevard	Arterial	4/5	25	Yes	Yes	No
SW Tualatin-Sherwood Road	Arterial	2-4/5	35	Yes	Yes	No
SW Langer Drive	Collector	3	25	Partial	Partial	No
SW Baler Way	Collector	3/4	25	Yes	No	Yes

¹ Per City of Sherwood Transportation System Plan (Reference 1)

² MPH: miles per hour

SW Langer Drive is the only roadway that borders the proposed development site. SW Langer Drive, classified as a collector, is intended to provide both access and circulation within and between residential and commercial/industrial areas. SW Tualatin-Sherwood Road and SW Sherwood Boulevard, as classified as arterials, are intended to provide local connectivity and support the principal arterial system, providing access to major commercial, residential, industrial, and institutional areas. **Figure 3** illustrates the existing lane configurations and traffic control devices at the study intersections.



Pedestrian Facilities

As shown in **Table 1**, SW Tualatin-Sherwood Road, SW Sherwood Boulevard and SW Baler Way have sidewalks within the site vicinity. Sidewalks are provided on one side on SW Langer Drive from SW Sherwood Boulevard to the 99W right-in/right-out (RIRO) access road, and on both sides east of the 99W RIRO access road. All the signalized study intersections have marked crosswalks. The intersection at SW Langer Drive and the 99W RIRO access road is the only unsignalized study intersection that has a marked crosswalk.

Bicycle Facilities

Bicycle access to the proposed site and within the study area is primarily provided with on-street bicycle lanes. The bicycle lanes provided on SW Langer Drive are narrow (approximately three feet wide) and extend from SW Sherwood Boulevard to the 99W RIRO access road. In addition, SW Tualatin-Sherwood Road has buffered bicycle lanes.

Transit Facilities

Local transit service is currently provided within the site vicinity by TriMet. TriMet Line 93 provides service between Sherwood and the Tigard Transit Center via SW Sherwood Boulevard, SW Langer Drive, SW Baler Way, and SW Tualatin-Sherwood Road (west of SW Baler Way) Monday through Sunday from 4:15 a.m. to 1:00 a.m. on 30 to 60 minute headways. TriMet Line 94 operates Monday through Friday between Sherwood and downtown Portland from 5:45 a.m. to 7:00 p.m. on 20 to 40 minute headways except from 6:30 a.m. to 8:30 a.m. where it operates with 5 to 10 minutes headways. The closest transit stop is currently located at the intersection of SW Langer Drive and the driveway at the west edge of the proposed development site.

TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Intersection turning-movement counts were conducted at the study intersections during October 2015. All the weekday counts were conducted on a typical mid-week day during the morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak time periods. The weekday a.m. peak hour occurs from 7:15 to 8:15 a.m. and the p.m. peak hour occurs from 4:55 to 5:55 p.m.

Figure 4 and **Figure 5** provide a summary of the year 2015 turning-movement counts at the study intersections.

Appendix "B" contains the traffic count worksheets used in this study.

Analysis Methodology

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (HCM) (Reference 2). The peak 15-minute flow rates were used in the evaluation of all intersection level-of-service (LOS) and volume-to-capacity (V/C) ratios. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour. Traffic conditions during typical weekday hours are expected to operate with lower levels of delay than those described in this report. The signalized and stop-controlled intersection operations analyses presented in this report were completed using Synchro 9 software.

City of Sherwood Operating Standards

Section 8 of The City of Sherwood's Transportation System Plan (Reference 1) sets operating standards for signalized, all-way stop-controlled (AWSC), two-way stop-controlled (TWSC) and roundabout intersections. For streets owned by Washington County or city-owned streets on the Arterial or Throughway network and outside of the Town Center (such as SW Tualatin-Sherwood Road) the standard is a V/C ratio of 0.99. For city-owned streets not on the Arterial or Throughway network and outside of the Town Center, the standards require signalized intersections, AWSC intersections, and roundabouts to meet LOS "D" or better or a V/C ratio less than 0.85. Mobility targets for TWSC intersections are LOS "E" or better or a V/C ratio of less than 0.90. For all intersection types, the level-of-service standard is assessed first and, if it is not met, the V/C target is considered.

Table 2 below, and **Figure 4** and **Figure 5** on the following pages, summarize the operational analysis for the study intersections under the weekday a.m. and p.m. peak hour existing traffic conditions, respectively. As shown, all of the study intersections currently operate acceptably. *Appendix "C"* includes the level-of-service worksheets for the year 2015 existing traffic conditions.

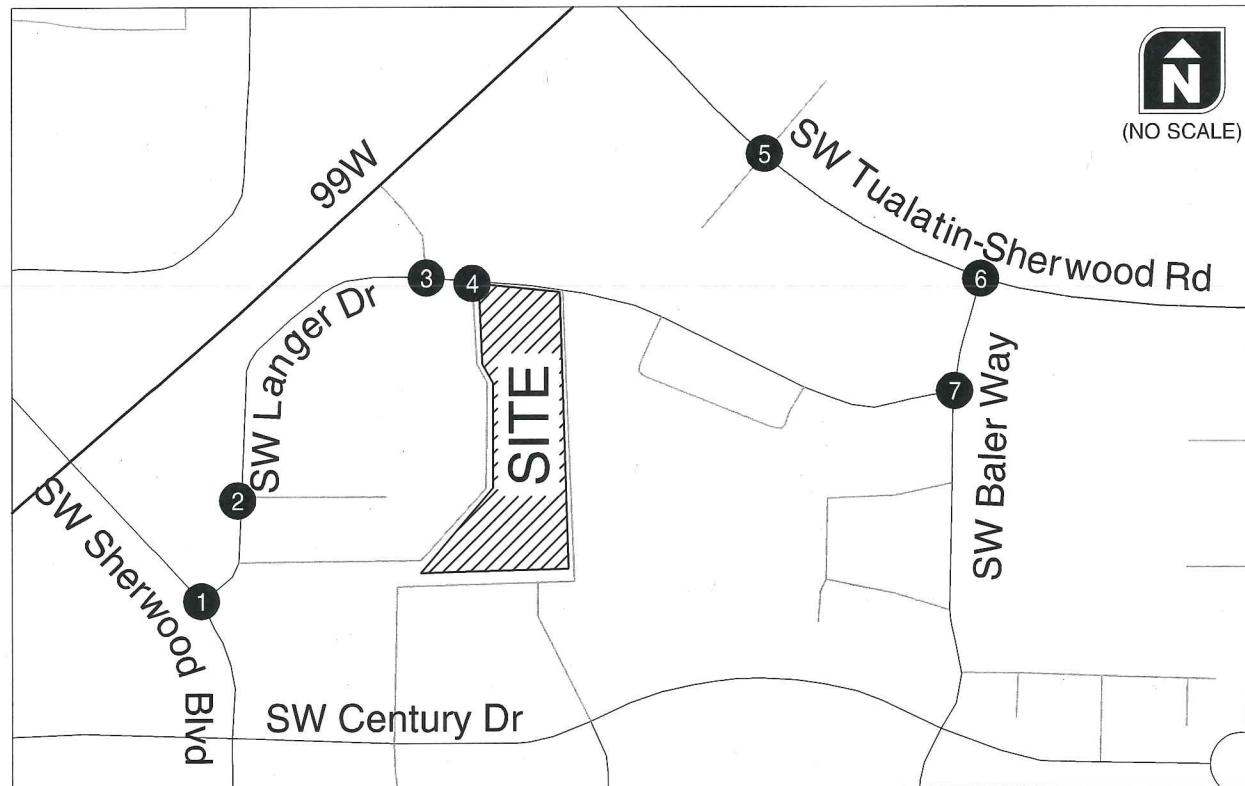
Table 2: Existing Conditions Operational Analysis Results

#	Intersection	LOS ¹		V/C ²		Jurisdiction ³	Standard	Met?
		AM	PM	AM	PM			
1	SW Langer Drive/SW Sherwood Boulevard	C (25.9)	C (25.0)	0.53	0.63	Washington County	V/C of 0.99	Yes
2	SW Langer Drive/Driveway on the north side of Dutch Bros.	B (10.1)	B (11.9)	0.12 (WB)	0.23 (WB)	City of Sherwood	LOS "E"	Yes
3	SW Langer Drive/99W right-in right-out access road	B (11.0)	C (15.9)	0.08 (SB)	0.25 (SB)	City of Sherwood	LOS "E"	Yes
4	SW Langer Drive/Driveway west edge of site	A (9.7)	B (11.2)	0.01 (NB)	0.07 (SB)	City of Sherwood	LOS "E"	Yes
5	SW Tualatin-Sherwood Road/Theater access	B (10.1)	B (14.4)	0.52	0.53	Regional	V/C of 0.99	Yes
6	SW Tualatin-Sherwood Road/SW Baler Way	A (7.9)	B (10.5)	0.57	0.74	Regional	V/C of 0.99	Yes
7	SW Langer Drive/SW Baler Way	B (10.1)	C (14.8)	0.11 (EB)	0.34 (EB)	City of Sherwood	LOS "E"	Yes

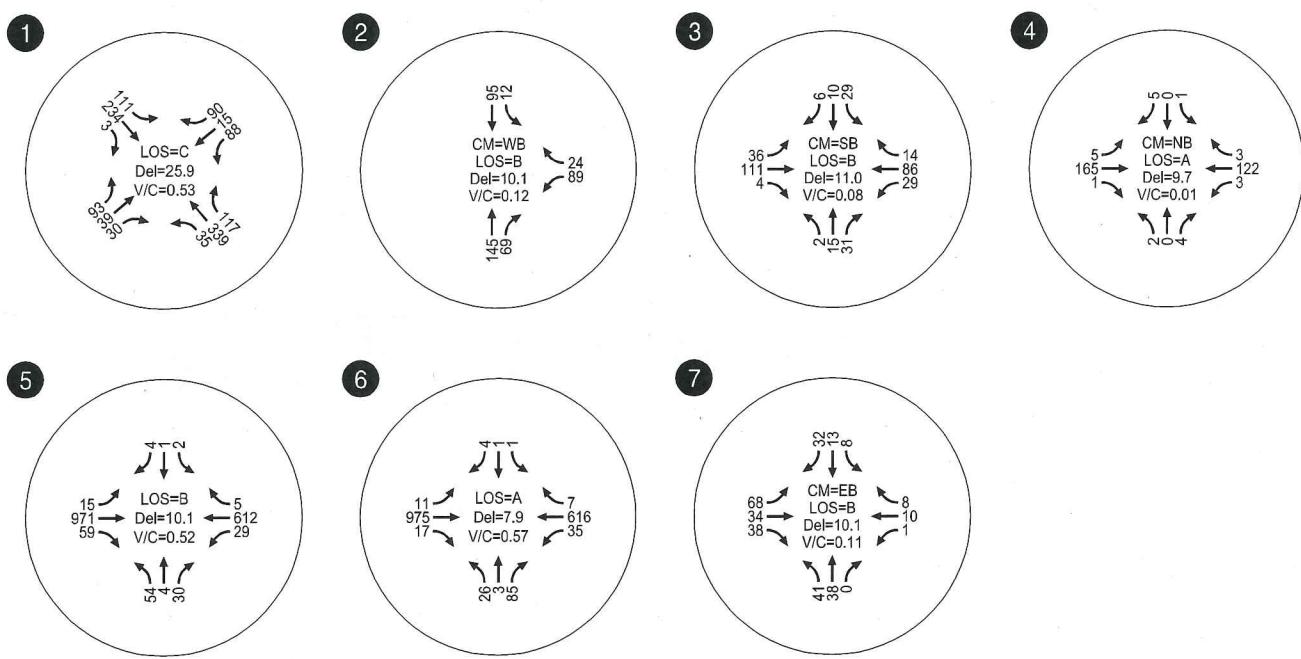
¹ HCM 2000 Level-of-Service and average per vehicle delay in seconds

² HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown.

³ Regional jurisdiction is governed by the Regional transportation Functional Plan (RTFP)



N
(NO SCALE)

**LEGEND**

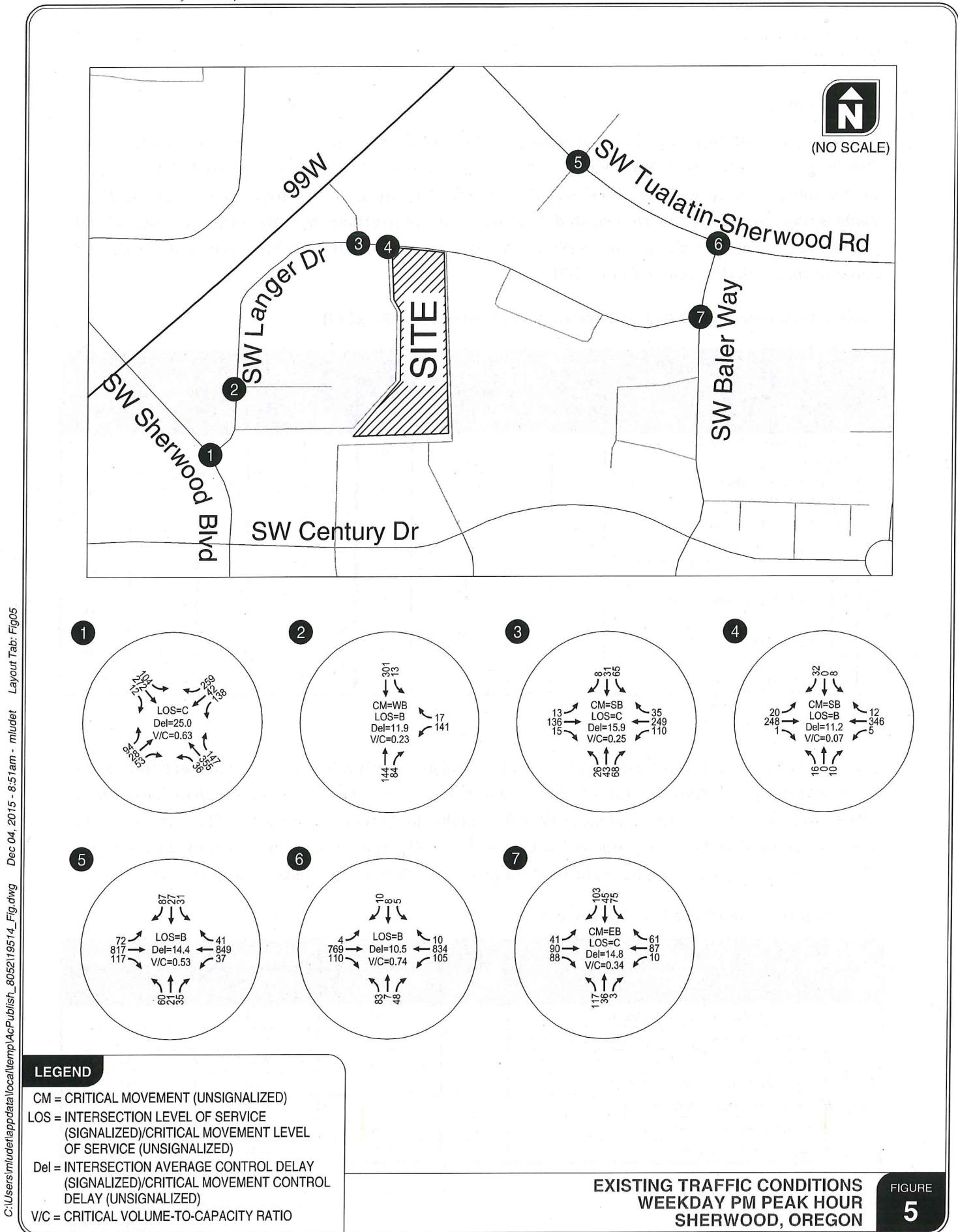
CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

EXISTING TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON

FIGURE
4



Traffic Safety

The reported crash history at the study intersections was reviewed to identify potential safety issues. The Oregon Department of Transportation (ODOT) provided crash records for the study intersections for the most recently available three-year period, from January 1, 2011 through December 31, 2013. **Table 3** summarizes the reported crash data at the study intersections over the three-year period and shows the calculated crash rates per million entering vehicles for each study intersection. *Appendix "D"* contains the crash data obtain from ODOT.

Table 3: Intersection Crash History (January 1, 2011 – December 31, 2013)

#	Intersection	Collision Type				Severity			Total Crashes	Crash Rate (per MEV ²)
		Rear-End	Turning Movement	Angle	Other	PDO ¹	Injury	Fatal		
1	SW Langer Drive/ SW Sherwood Boulevard	2	1	1	0	1	3	0	4	0.24
2	SW Langer Drive/Driveway on the north side of Dutch Bros.	0	0	0	0	0	0	0	0	0.00
3	SW Langer Drive/99W right-in right-out access road	0	0	5	0	3	2	0	5	0.57
4	SW Langer Drive/Driveway west edge of site	0	0	0	0	0	0	0	0	0.00
5	SW Tualatin-Sherwood Road/Theater access	12	1	1	3	11	6	0	17	0.71
6	SW Tualatin-Sherwood Road/SW Baler Way	2	8	0	0	6	4	0	10	0.46
7	SW Langer Drive/SW Baler Way	0	1	2	0	3	0	0	3	0.36

¹ PDO = Property Damage Only

² MEV = Million Entering Vehicles

Table 4 summarizes a comparison between the calculated crash rates for each intersection and the published 90th percentile crash rates from the *Assessment of Statewide Intersection Safety Performance* (Reference 3) per ODOT methodology as described in the *Analysis Procedure Manual* (Reference 4). The results indicate that the intersection of SW Langer Drive/99W right-in right-out access road exceeds the 90th percentile crash rate and needs further examination, which is described on the next page.

Table 4: Intersection Crash Rate Assessment

#	Intersection	Total Crashes	90th Percentile Crash Rate	Observed Crash Rate at Intersection	Observed Crash Rate > 90th Percentile Crash Rate?
1	SW Langer Drive/ SW Sherwood Boulevard	4	0.86	0.24	No
2	SW Langer Drive/Driveway on the north side of Dutch Bros.	0	0.29	0.00	No
3	SW Langer Drive/99W right-in right-out access road	5	0.41	0.57	Yes
4	SW Langer Drive/Driveway west edge of site	0	0.41	0.00	No
5	SW Tualatin-Sherwood Road/Theater access	17	0.86	0.71	No
6	SW Tualatin-Sherwood Road/SW Baler Way	10	0.86	0.46	No
7	SW Langer Drive/SW Baler Way	3	0.41	0.36	NA

During the three-year study period, five crashes were reported at the intersection of SW Langer Drive/99W right-in right-out access road, which is within 200 feet of the access point from the proposed development to SW Langer Road. All five reported crashes were angle crashes, with two of the five crashes resulting in injuries (the other three crashes were property-damage only). All five crashes involved a collision between a vehicle that crossed SW Langer Road in either the northbound or southbound direction with a vehicle that was traveling east or west on SW Langer Road.

ODOT and Washington County maintain a Safety Priority Index System (SPIS) list to identify existing hazardous intersections for potential safety improvements. Intersections are included in the SPIS list if they have three or more crashes or if they have one or more severe injury or fatal crashes within three consecutive years. The intersection at SW Baler Way and SW Tualatin-Sherwood Road is identified in the 2011-2013 Washington County SPIS List with a SPIS score of 66.6 out of 100. The SPIS score is calculated based on three factors:

- Frequency of crashes (25% of the SPIS score)
- Rate of crashes (25% of the SPIS score)
- Severity of crashes (50% of the SPIS score)

TRAFFIC IMPACT ANALYSIS

The transportation impact analysis describes how the study area's transportation system will operate in the year 2016 when the proposed development is expected to be fully built-out. The impact of traffic generated by the proposed development during the typical weekday a.m. and p.m. peak hours was examined as follows:

- In-process developments and planned transportation improvements in the site vicinity were identified and incorporated into the traffic operations study.
- Year 2016 background traffic conditions (without the proposed development) were analyzed at each of the study intersections during the weekday a.m. and p.m. peak hours.
 - Planned improvements along SW Tualatin-Sherwood Road, including new signal phasing at the intersection of SW Tualatin-Sherwood Road/SW Baler Way, conversion of the signalized intersection at SW Tualatin-Sherwood Road/Theater access to right-in, right-out access, and widening of westbound SW Tualatin-Sherwood Road to two through lanes were incorporated into the traffic operations study.
 - Background conditions included applying a 1.5 percent annual growth rate to existing traffic volumes to account for traffic growth in the site vicinity between the years 2015 and 2016.

- Year 2016 total traffic conditions (with full build-out and occupation of the proposed development) were analyzed at each of the study intersections and site-access points during the weekday a.m. and p.m. peak hours. This analysis included:
 - Site-generated trips were estimated for build-out of the site.
 - Site trip-distribution patterns were derived after the existing traffic patterns, the major trip origins and destinations in Sherwood, and input from City staff.

YEAR 2016 BACKGROUND TRAFFIC CONDITIONS

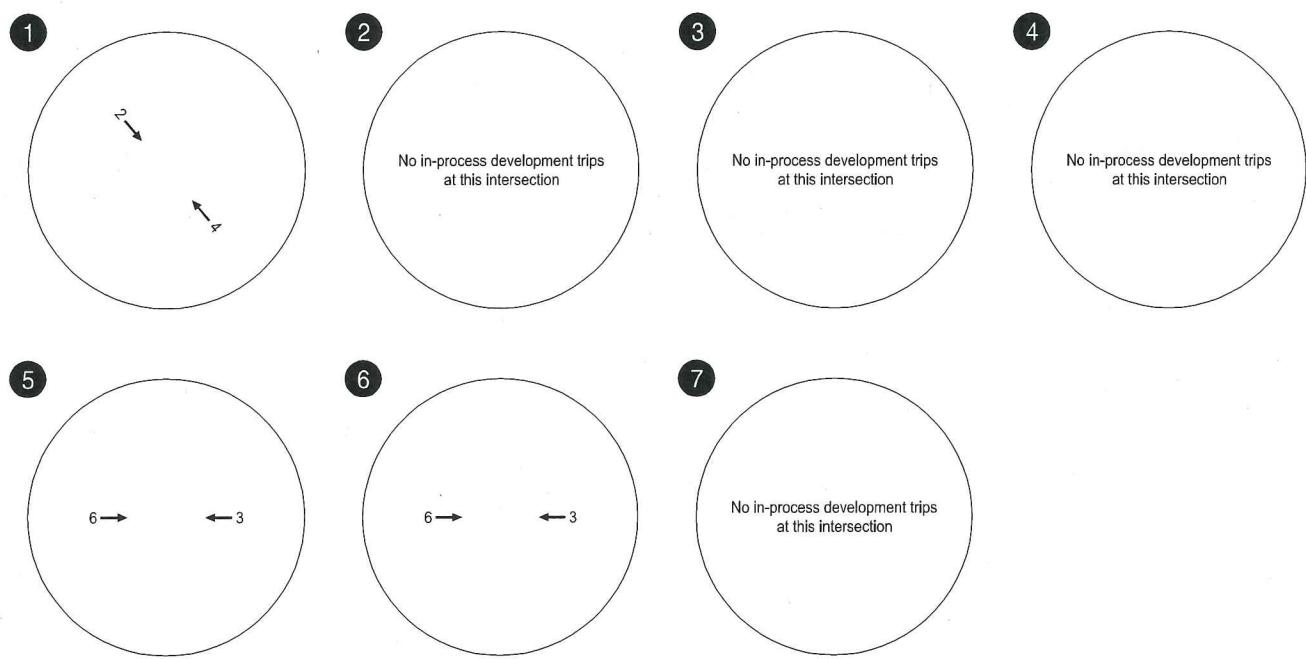
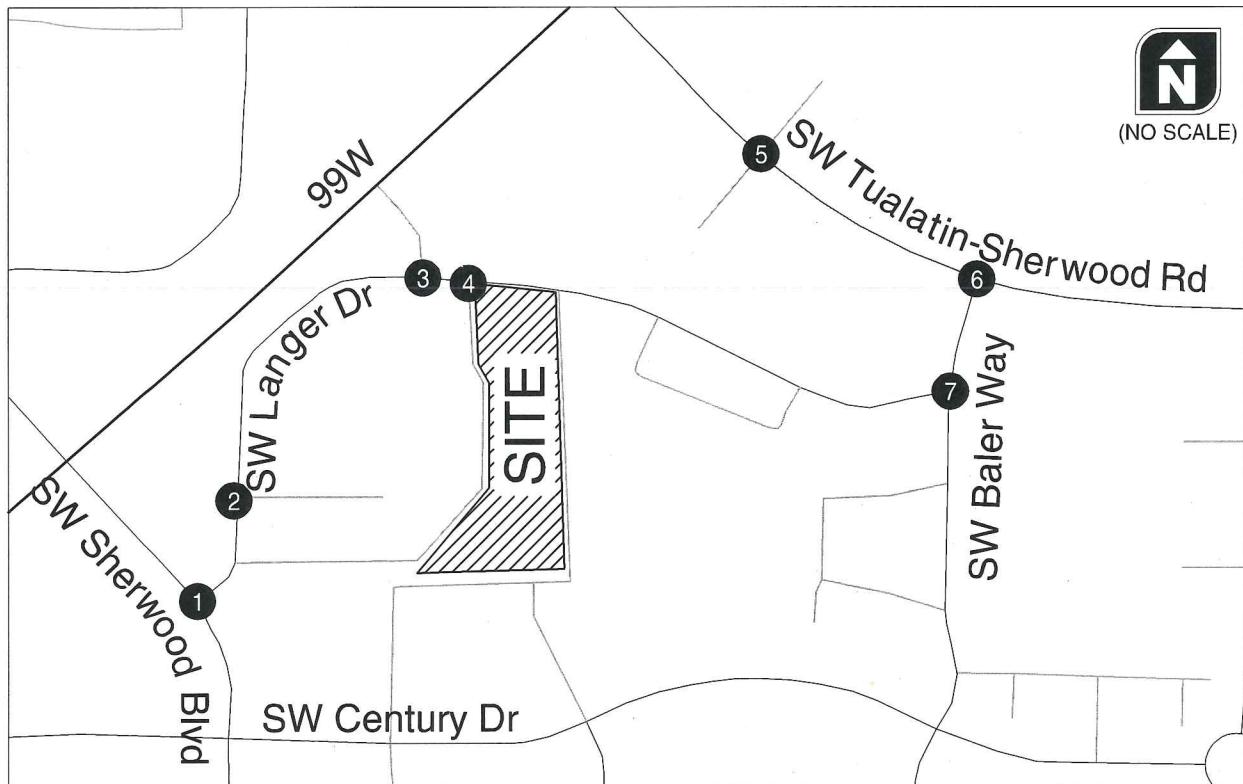
The year 2016 background traffic conditions analysis identifies how the study area's transportation system will operate without the proposed development. This analysis includes trips from in-process developments in the vicinity, traffic attributed to general growth in the region, and rerouted trips due to the conversion of the signalized intersection at SW Tualatin-Sherwood Road/Theater access to right-in/right-out access, but does not include traffic from the proposed development.

In-Process Developments

Table 5 identifies the in-process developments trip generation in the site vicinity. All the in-process developments are part of the Langer Farms project (Reference 5), which is located between SW Tualatin-Sherwood Road and SW Century Drive, east of SW Langer Farms Parkway. A site visit confirmed that approximately three percent of the shopping center retail space, the drive-thru bank, and the quality restaurant have not been occupied yet. Based on the trip distribution for the Langer Farms project, 25 percent of "inbound" and 15 percent of "outbound" in-process trips would travel eastbound and westbound, respectively on SW Tualatin-Sherwood Road, and 10 percent of "inbound" and 20 percent of "outbound" in-process trips would travel eastbound and westbound, respectively on SW Sherwood Boulevard. Most of the Langer Farms project in-process trips do not travel through the study intersections for this multi-family development project. **Figure 6** and **Figure 7** illustrate the traffic generated by the in-process developments.

Table 5: Trip Generation for the Identified In-Process Developments

In-Process Development	ITE Code	Size (Sq. Ft)	Weekday AM Peak Hour			Weekday PM Peak Hour		
			Total	In	Out	Total	In	Out
Shopping Center <i>Pass-By Trips (34%)</i>	820	5,800	29 (10)	18 (6)	11 (4)	28 (10)	14 (5)	14 (5)
Quality restaurant <i>Internalization (10%)</i> <i>Pass-By Trips (44%)</i>	931	10,000	8 (1) (3)	7 (1) (3)	1 (0) (0)	75 (10) (30)	50 (5) (15)	25 (5) (15)
Bank w/ drive-thru <i>Internalization (10%)</i> <i>Pass-By Trips (47%)</i>	912	3,500	43 (4) (20)	20 (2) (9)	23 (2) (11)	90 (10) (40)	45 (5) (20)	45 (5) (20)
Total Trips			80	45	35	193	109	84
<i>Less Internalization</i>			(5)	(3)	(2)	(20)	(10)	(10)
<i>Less Pass-By Trips</i>			(33)	(18)	(15)	(80)	(40)	(40)
New Trips			42	24	18	93	59	34

**LEGEND**

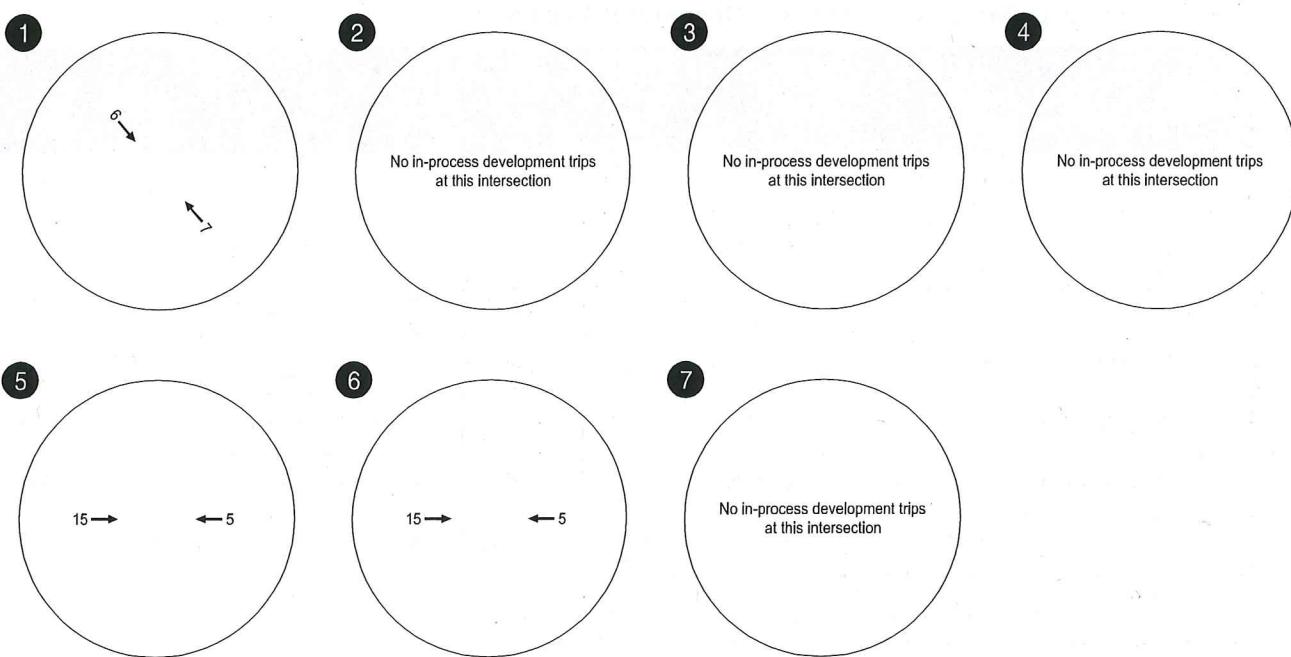
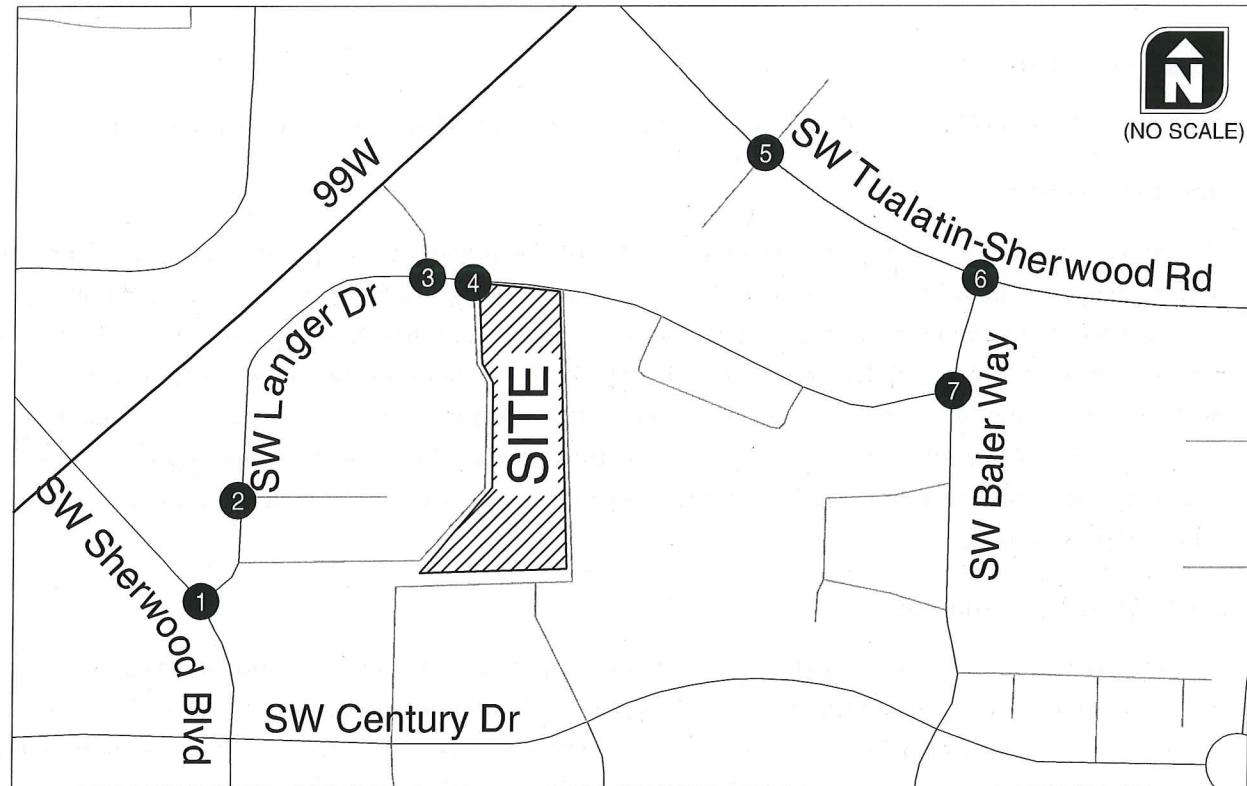
CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**IN-PROCESS DEVELOPMENT TRIPS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON**

**FIGURE
6**

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**IN-PROCESS DEVELOPMENT TRIPS
 WEEKDAY PM PEAK HOUR
 SHERWOOD, OREGON**

**FIGURE
 7**

Background Growth

The City of Sherwood has identified an annual growth rate for background traffic of 1.5 percent.

Rerouted Traffic

The conversion of the existing signalized intersection of SW Tualatin-Sherwood Road/Theater access to a right-in, right-out intersection required that certain existing traffic movements (westbound left, eastbound left, northbound left and through, and south left and through) be rerouted. Specifically, the City of Sherwood suggested that the intersection SW Tualatin-Sherwood Road/SW Baler Way would be likely to accommodate some of the rerouted traffic. **Figure 8** illustrates the background lane configurations and traffic control devices at the study intersections. **Figure 9** and **Figure 10** on the following pages illustrate how traffic volumes were rerouted to other intersections for the weekday a.m. and p.m. peak hour.

Level-of-Service Analysis

The weekday a.m. and p.m. peak-hour turning-movement volumes and operational results shown in **Figure 11** and **Figure 12** show the results of the year 2016 background traffic analysis. As indicated by the respective figures and shown in **Table 6**, the background traffic analysis determined that all of the study intersections are forecast to operate acceptably during both weekday a.m. and p.m. peak hours.

Table 6: Year 2016 Background Conditions Operational Analysis

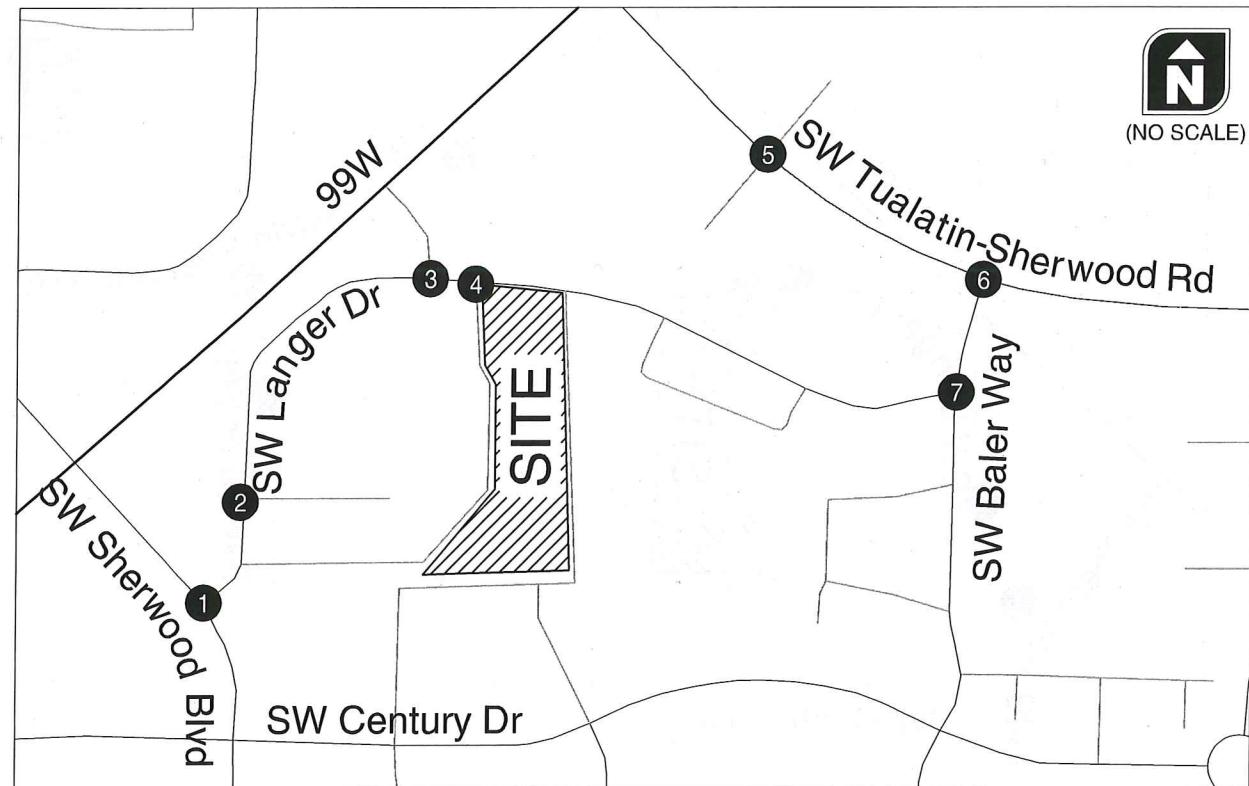
#	Intersection	LOS ¹		V/C ²		Jurisdiction ³	Standard	Met?
		AM	PM	AM	PM			
1	SW Langer Drive/ SW Sherwood Boulevard	C (26.4)	C (25.6)	0.54	0.64	Washington County	V/C of 0.99	Yes
2	SW Langer Drive/Driveway on the north side of Dutch Bros.	B (10.2)	B (12.0)	0.13 (WB)	0.24 (WB)	City of Sherwood	LOS "E"	Yes
3	SW Langer Drive/99W right-in right-out access road	B (11.1)	C (16.4)	0.08 (SB)	0.26 (SB)	City of Sherwood	LOS "E"	Yes
4	SW Langer Drive/Driveway west edge of site	A (9.8)	B (11.5)	0.01 (NB)	0.07 (SB)	City of Sherwood	LOS "E"	Yes
5	SW Tualatin-Sherwood Road/Theater access	B (13.3)	B (14.4)	0.08 (NB)	0.15 (NB)	Regional	V/C of 0.99	Yes
6	SW Tualatin-Sherwood Road/SW Baler Way	A (9.9)	B (14.5)	0.43	0.48	Regional	V/C of 0.99	Yes
7	SW Langer Drive/SW Baler Way	B (10.4)	C (16.7)	0.16 (WB)	0.36 (EB)	City of Sherwood	LOS "E"	Yes

¹ HCM 2000 Level-of-Service and average per vehicle delay in seconds

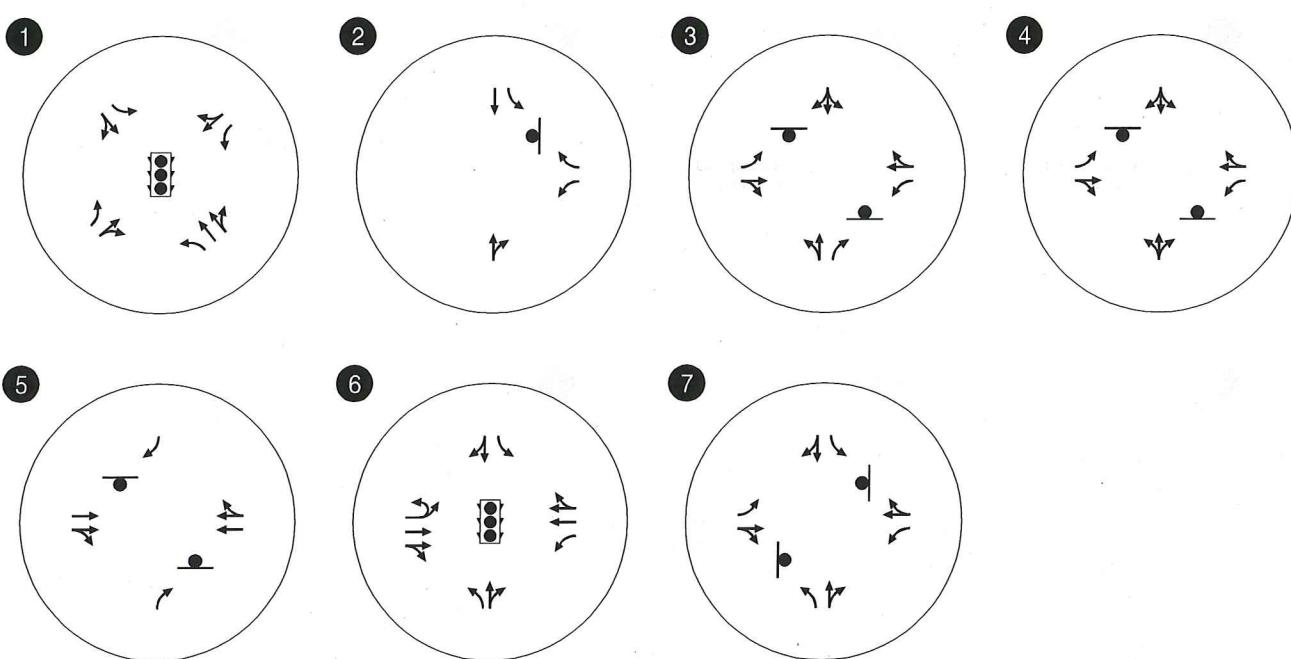
² HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown.

³ Regional jurisdiction is governed by the Regional transportation Functional Plan (RTFP)

Appendix E contains the year 2016 background traffic level-of-service worksheets.



N
(NO SCALE)

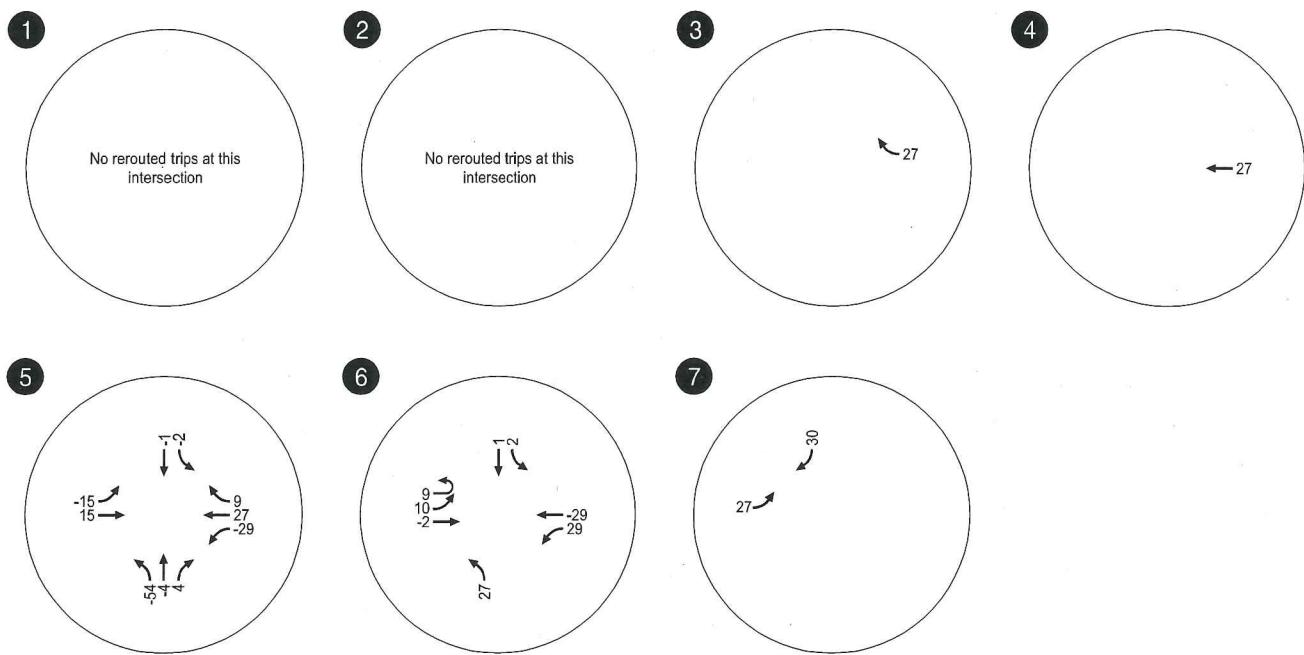
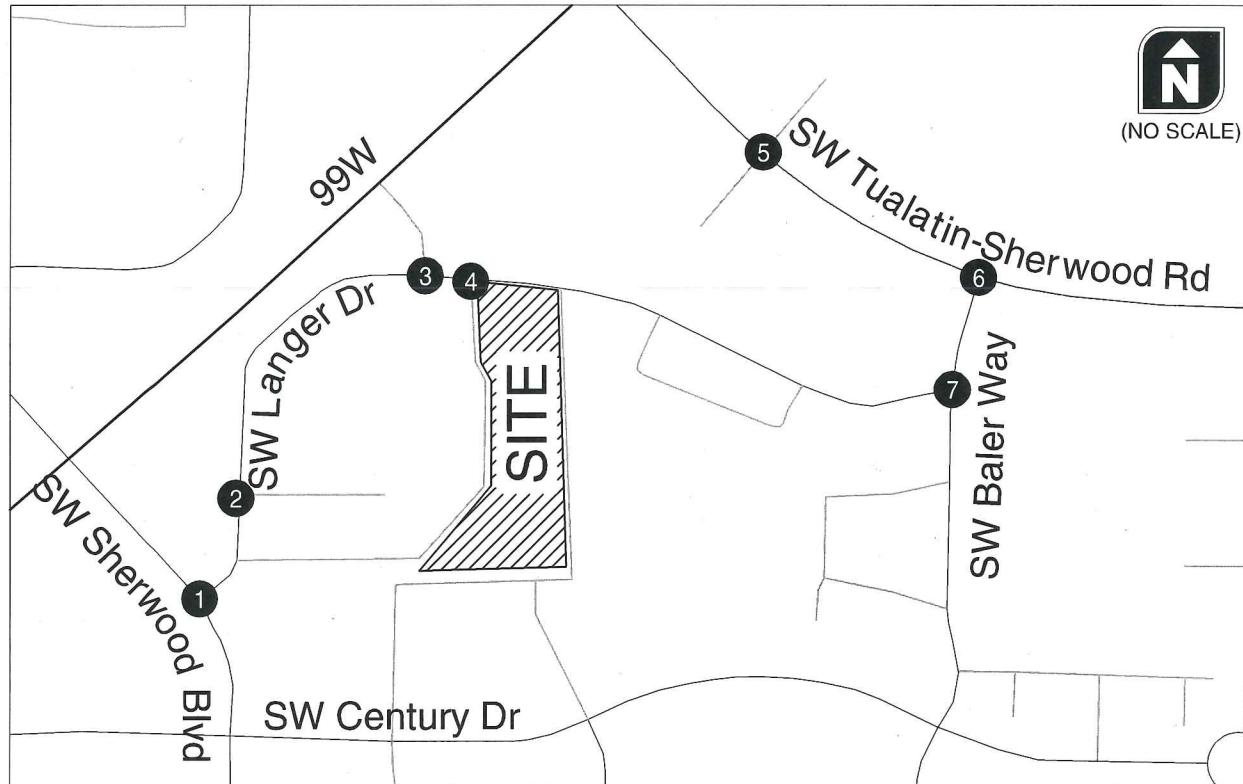


LEGEND

- CM = CRITICAL MOVEMENT (UNSIGNALIZED)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

BACKGROUND TRAFFIC LANE CONFIGURATIONS
AND TRAFFIC CONTROL DEVICES
SHERWOOD, OREGON

FIGURE
8

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

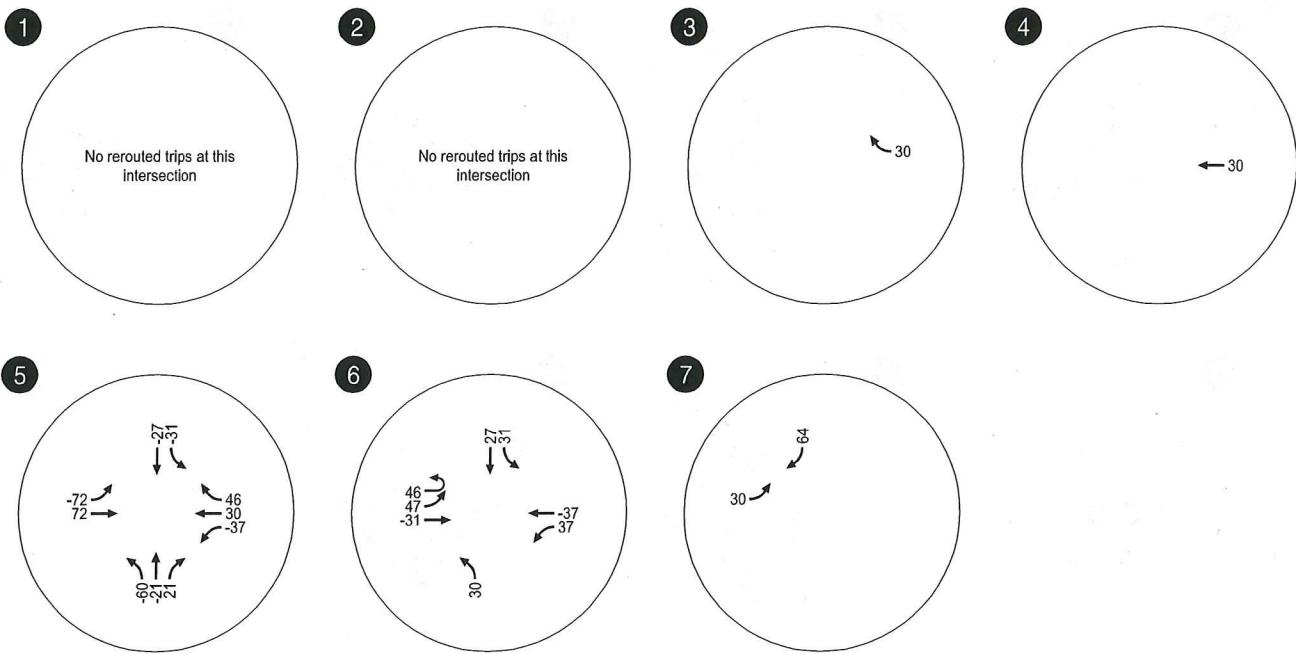
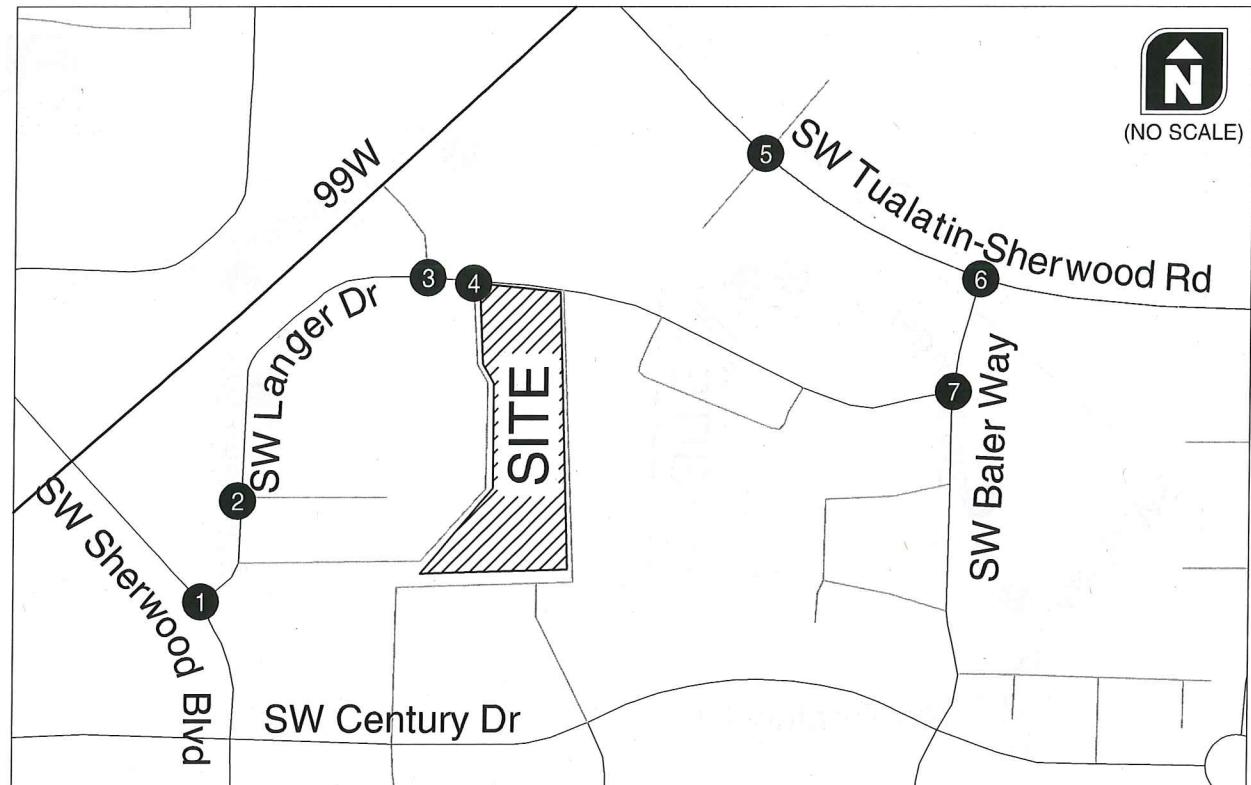
LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

REROUTED TRIPS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON

FIGURE

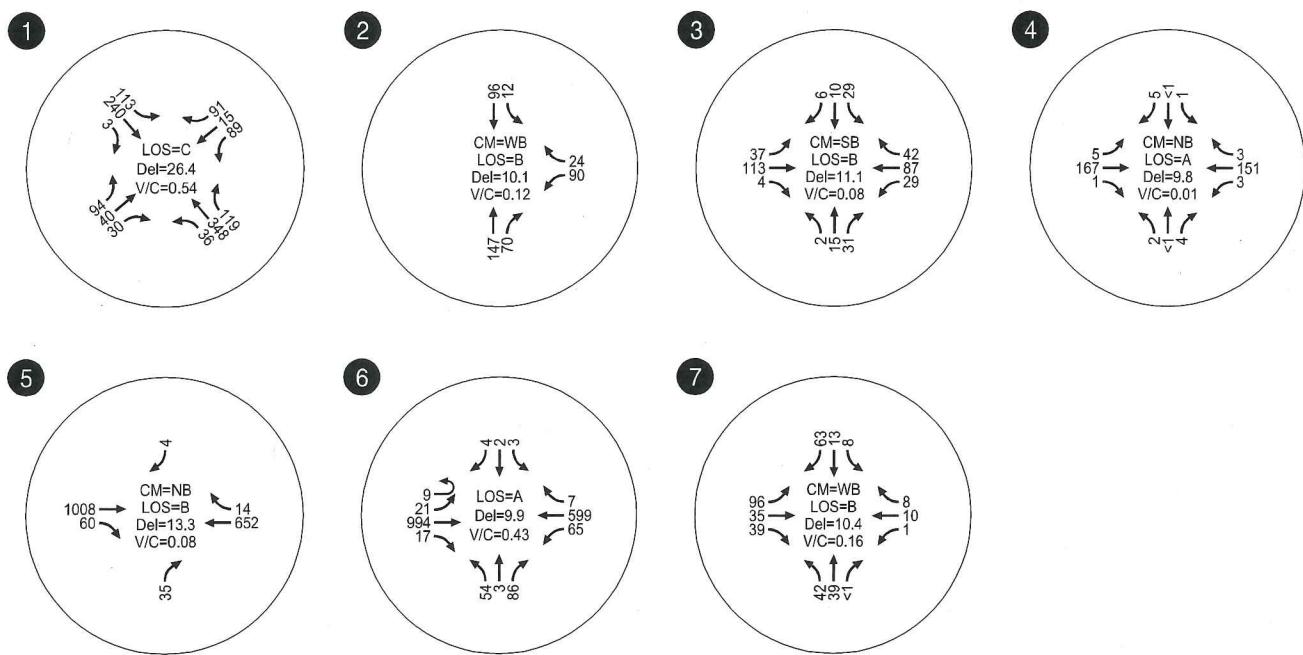
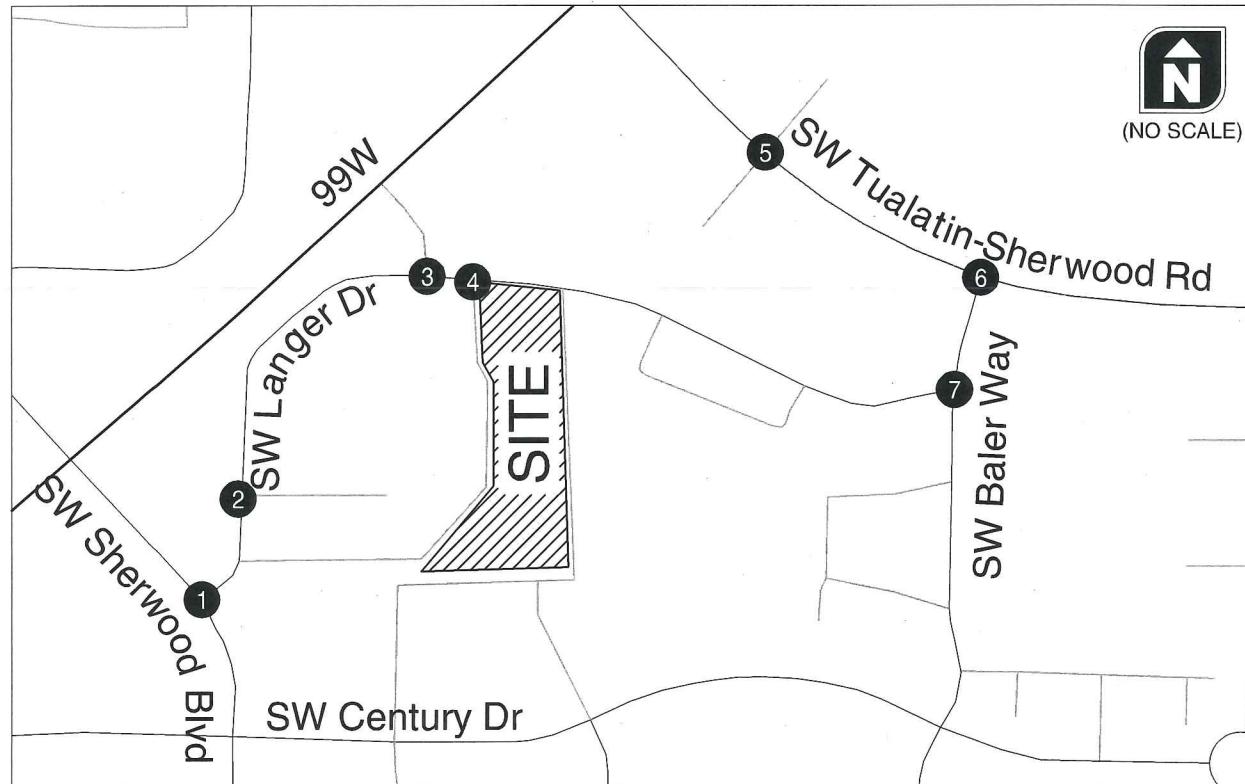
9

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

REROUTED TRIPS
 WEEKDAY PM PEAK HOUR
 SHERWOOD, OREGON

**FIGURE
10**

**LEGEND**

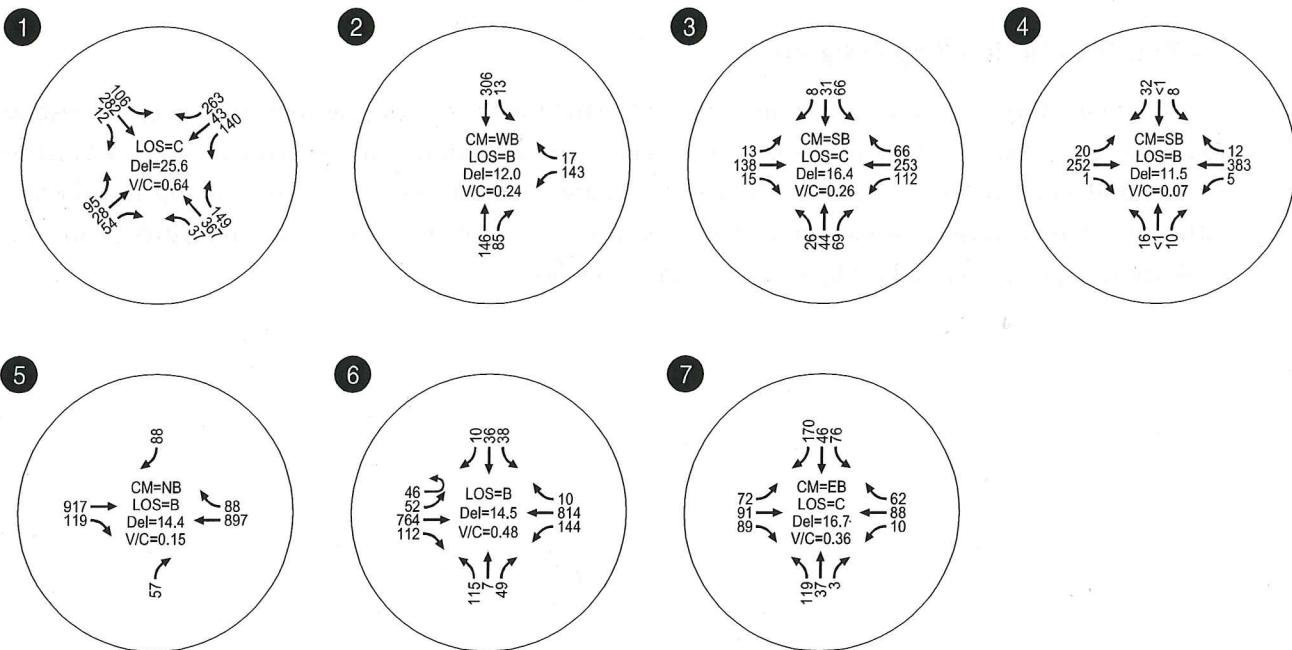
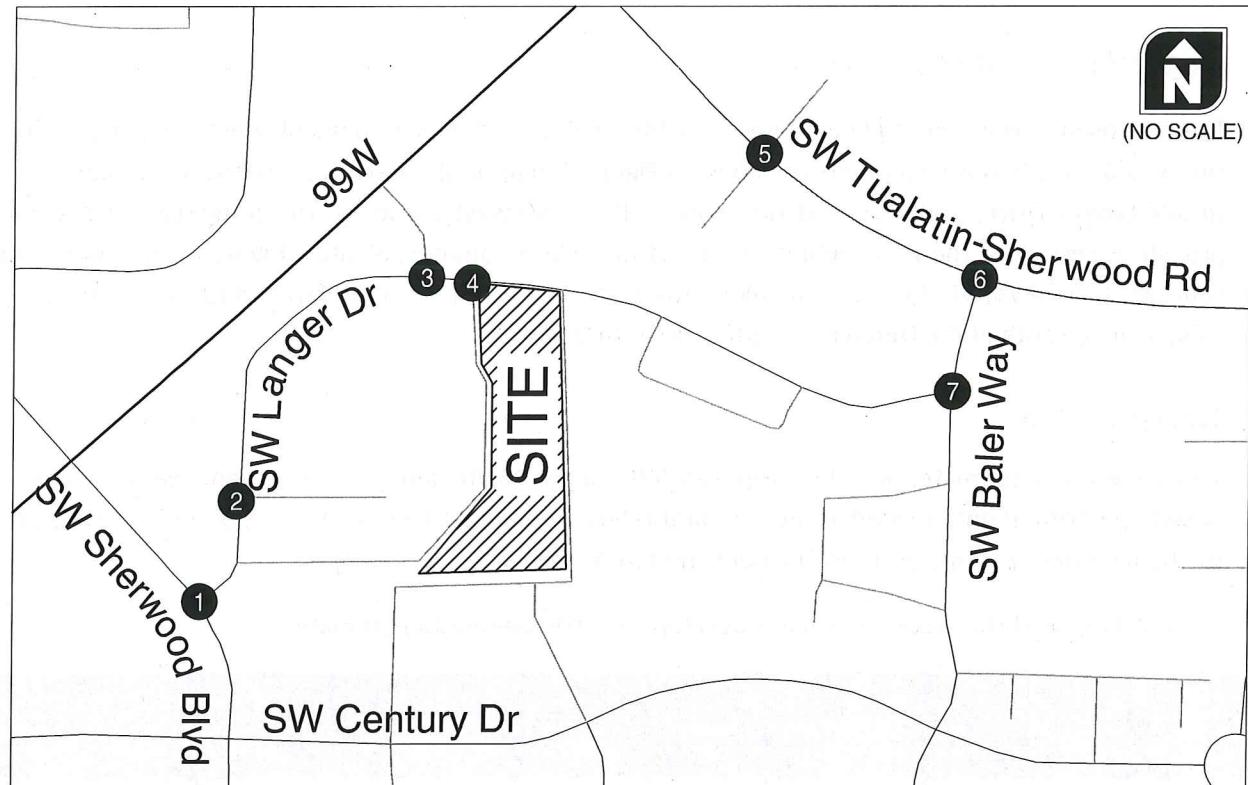
CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**YEAR 2016 BACKGROUND TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON**

**FIGURE
11**

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2016 BACKGROUND TRAFFIC CONDITIONS
 WEEKDAY PM PEAK HOUR
 SHERWOOD, OREGON

FIGURE
12

PROPOSED DEVELOPMENT PLAN

The proposed development plan assumed for this analysis includes 82 units of rental apartments. The site would have two access points as shown in **Figure 2**, one on the northwest corner providing access to SW Langer Drive, and a second driveway at the southwest corner of the property which would provide access onto the road behind the Sherwood Plaza commercial site. Drivers would access the southwest driveway via the roadway along the south side of Sherwood Plaza, which connects to SW Langer Drive south of the Dutch Bros. coffee drive-through.

Trip Generation

Trip generation estimates for the proposed SW Langer Multi-Family Development were developed based on information provided in the standard reference manual *Trip Generation, 9th Edition* published by the Institute of Transportation Engineers (Reference 6).

Table 7: Proposed Sherwood Apartment Development Trip Generation Estimate

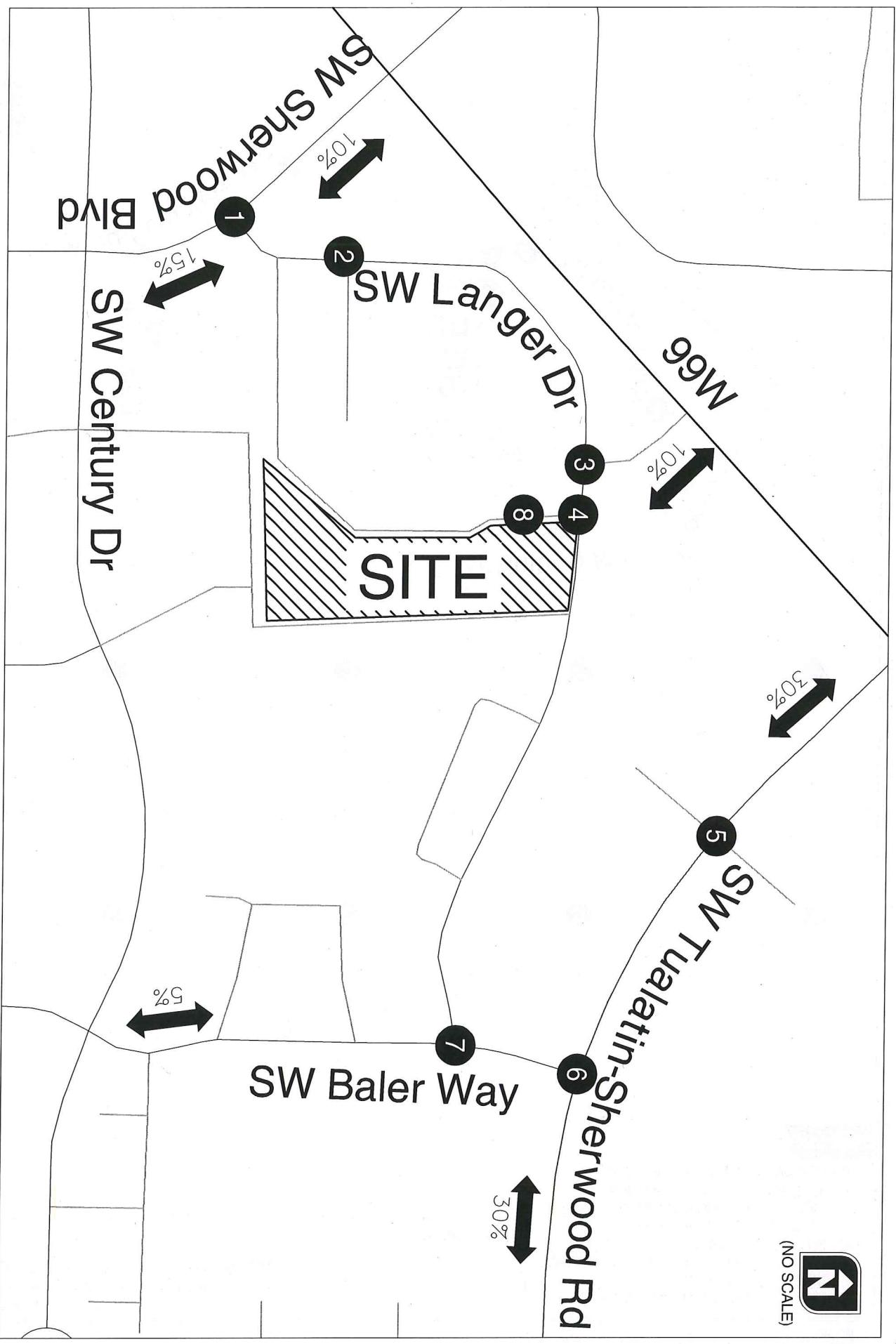
Land Use	ITE Code	Number of dwelling units	Weekday Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Apartment	220	82	545	42	8	34	51	33	18

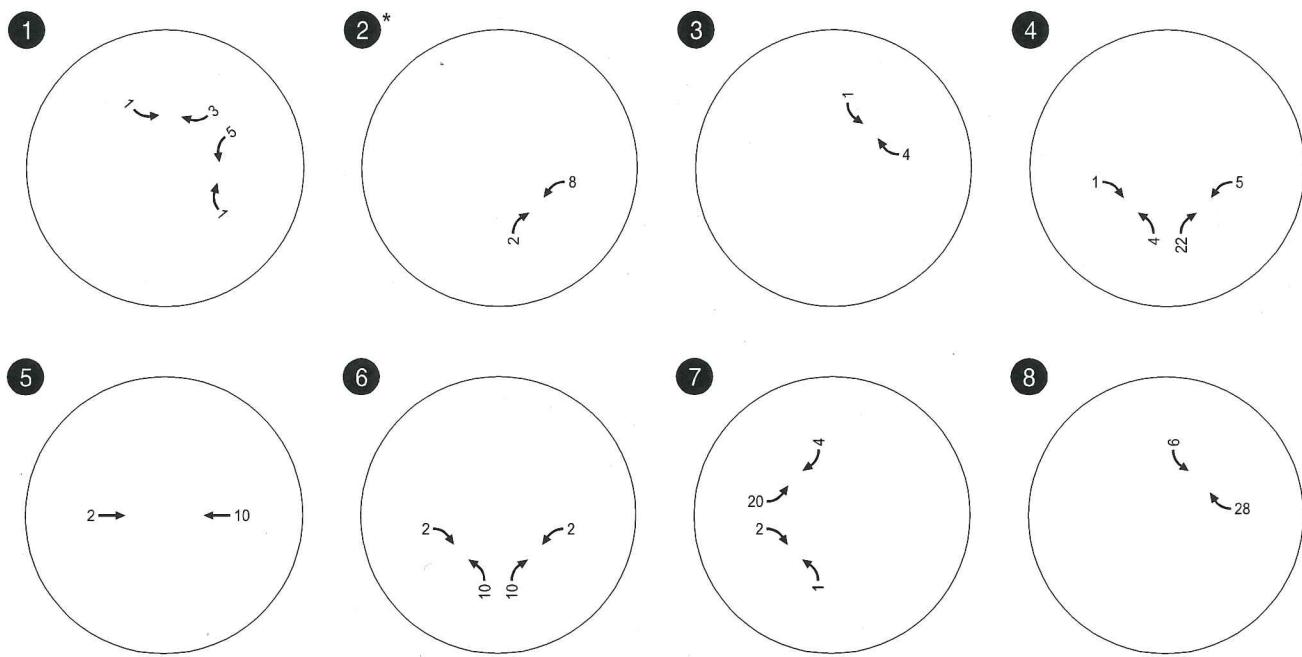
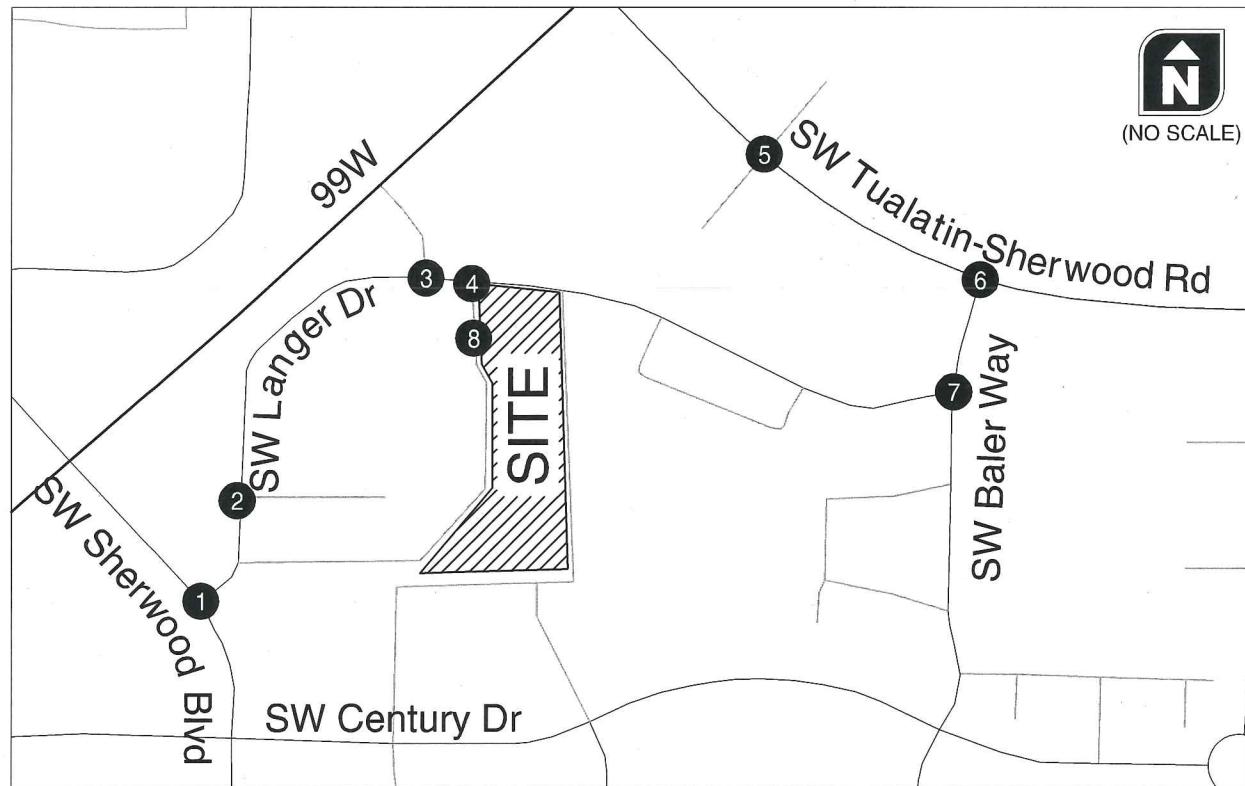
Site Trip Distribution/Trip Assignment

The site-generated trips were distributed onto the study area roadway system according to existing traffic patterns, the location of major trip origins and destinations in Sherwood and Washington County, and input from City of Sherwood staff. **Figure 13** illustrates the estimated trip distribution pattern for the proposed development. The new site-generated trips are shown in **Figure 14** for the weekday a.m. peak hour and in **Figure 15** for the weekday p.m. peak hour.

ESTIMATED TRIP DISTRIBUTION PATTERN
SHERWOOD, OREGON

FIGURE
13



**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

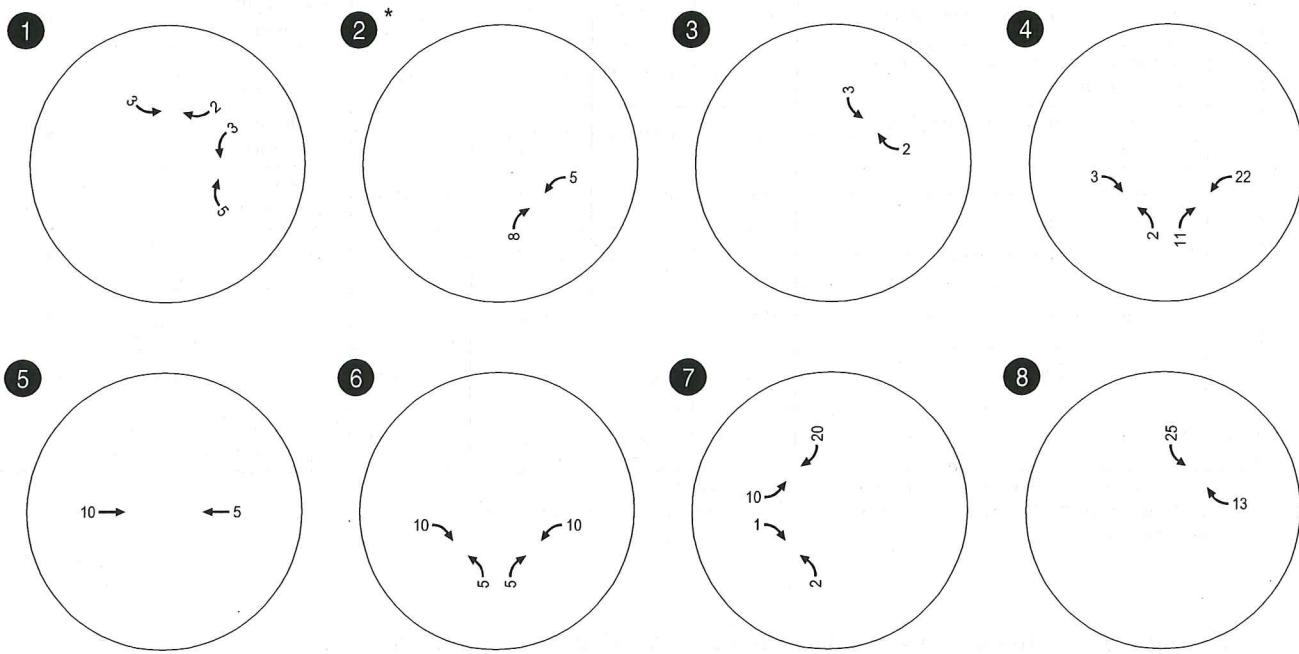
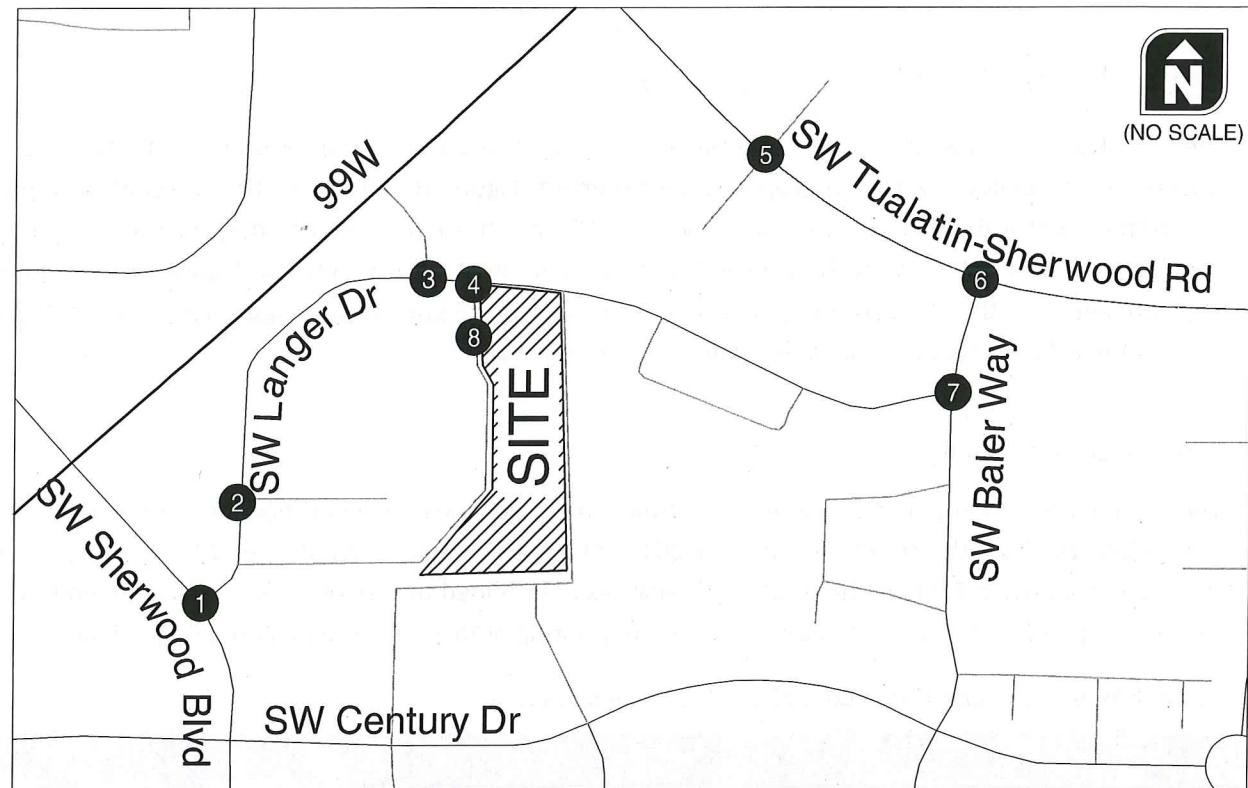
LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

*Note: The "right-in" turns at this intersection will likely occur at the intersection immediately to the south.

**NET NEW SITE-GENERATED TRIPS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON**

**FIGURE
14**

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

*Note: The "right-in" turns at this intersection will likely occur at the intersection immediately to the south.

**NET NEW SITE-GENERATED TRIPS
WEEKDAY PM PEAK HOUR
SHERWOOD, OREGON**

**FIGURE
15**

YEAR 2016 TOTAL TRAFFIC CONDITIONS

The total traffic conditions analysis forecasts how the study area's transportation system will operate with the traffic generated by the proposed development. **Figure 16** illustrates the lane configurations and traffic control devices assumed in the year 2016 total traffic conditions analysis. The year 2016 background traffic volumes for the weekday a.m. and p.m. peak hours (shown in **Figure 11** and **Figure 12**) were added to the net new site-generated traffic (shown in **Figure 14** and **Figure 15**) to arrive at the total traffic volumes that are shown in **Figure 17** and **Figure 18**.

Level-of-Service Analysis

The weekday a.m. and p.m. peak-hour turning-movement volumes and operational results in **Figure 17** and **Figure 18** show the results of the year 2016 total traffic analysis. As indicated by the respective figures and shown in **Table 8**, the total traffic analysis determined that all of the study intersections and site-access points are forecast to operate acceptably during both weekday a.m. and p.m. peak-hours.

Table 8: Year 2016 Total Traffic Conditions Operational Analysis

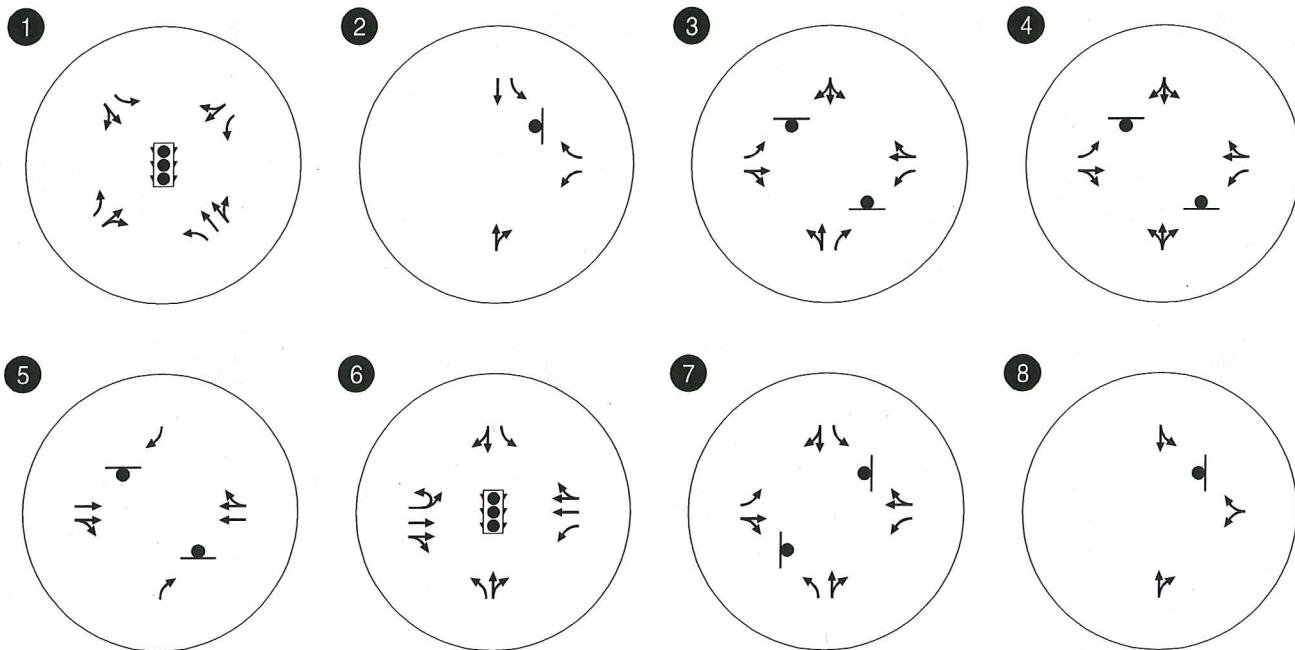
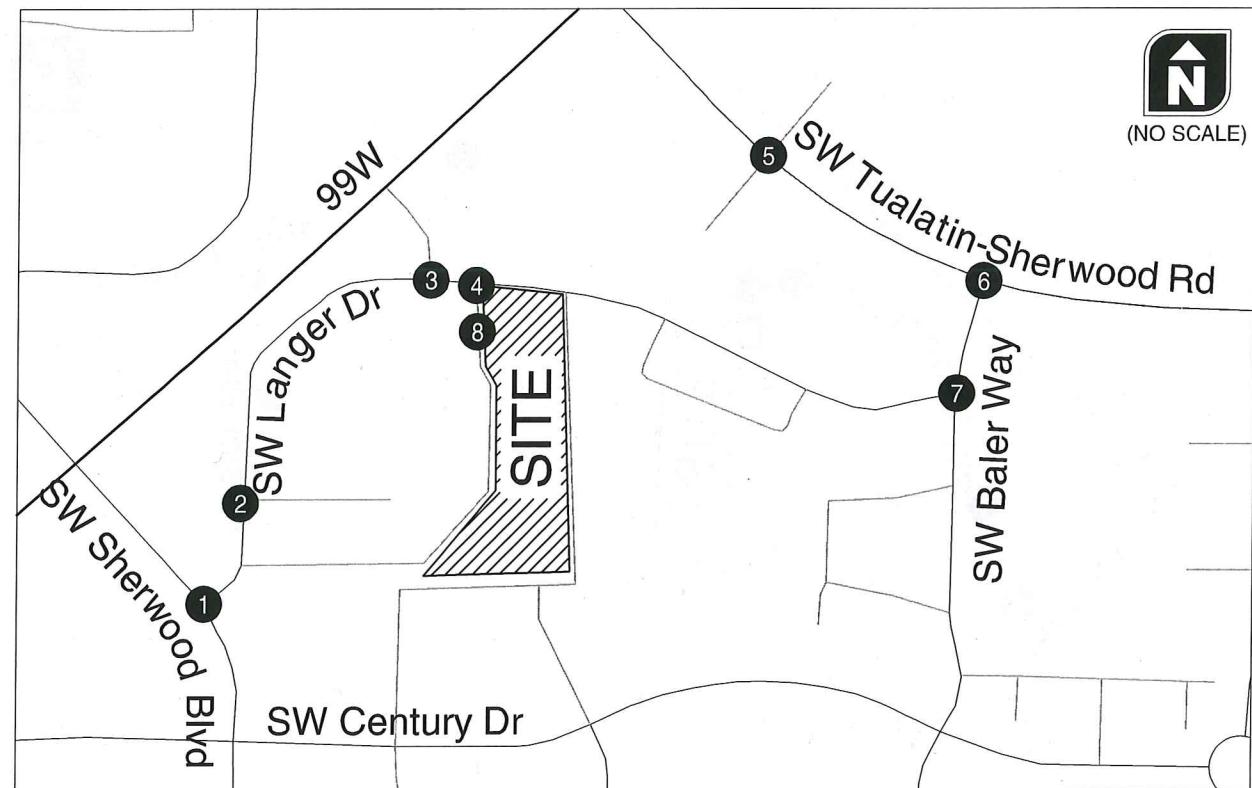
#	Intersection	LOS ¹		V/C ²		Jurisdiction ³	Standard	Met?
		AM	PM	AM	PM			
1	SW Langer Drive/ SW Sherwood Boulevard	C (25.4)	C (25.9)	0.56	0.64	Washington County	V/C of 0.99	Yes
2	SW Langer Drive/Driveway on the north side of Dutch Bros.	B (10.2)	B (12.1)	0.14 (WB)	0.24 (WB)	City of Sherwood	LOS "E"	Yes
3	SW Langer Drive/99W right-in right-out access road	B (11.1)	C (16.6)	0.08 (SB)	0.27 (SB)	City of Sherwood	LOS "E"	Yes
4	SW Langer Drive/Driveway west edge of site	A (9.9)	B (11.9)	0.05 (NB)	0.08 (NB)	City of Sherwood	LOS "E"	Yes
5	SW Tualatin-Sherwood Road/Theater access	B (13.3)	B (14.5)	0.08 (NB)	0.15 (NB)	Regional	V/C of 0.99	Yes
6	SW Tualatin-Sherwood Road/SW Baler Way	B (10.4)	B (14.9)	0.44	0.49	Regional	V/C of 0.99	Yes
7	SW Langer Drive/SW Baler Way	B (10.6)	C (17.5)	0.19 (EB)	0.36 (EB)	City of Sherwood	LOS "E"	Yes
8	West Site Driveway/Site Driveway	A (8.4)	A (8.5)	0.03 (WB)	0.01 (WB)	City of Sherwood	LOS "E"	Yes

¹ HCM 2000 Level-of-Service and average per vehicle delay in seconds

² HCM 2000 Volume-to-Capacity ratio. For TWSC intersections, the critical movement is shown.

³ Regional jurisdiction is governed by the Regional transportation Functional Plan (RTFP)

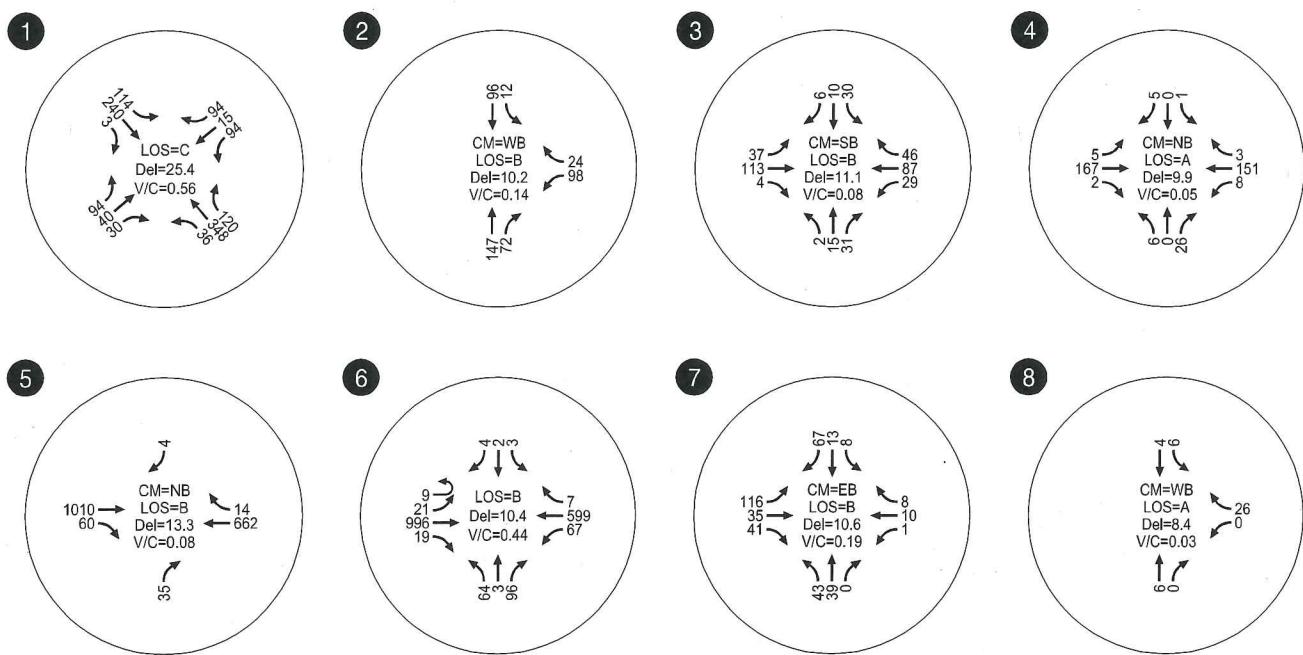
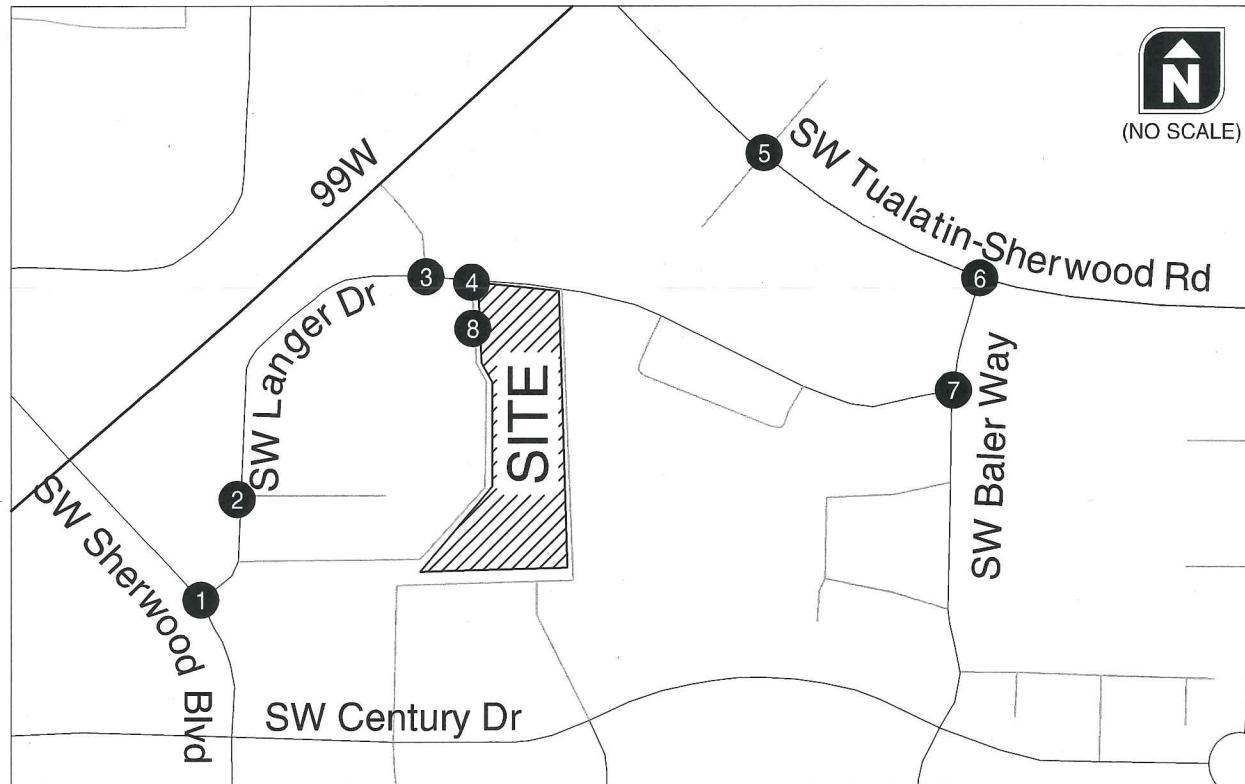
Appendix "F" contains the year 2016 total traffic level-of-service worksheets.

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
 LOS = INTERSECTION LEVEL OF SERVICE
 (SIGNALIZED)/CRITICAL MOVEMENT LEVEL
 OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY
 (SIGNALIZED)/CRITICAL MOVEMENT CONTROL
 DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2016 TOTAL TRAFFIC LANE CONFIGURATIONS
 AND TRAFFIC CONTROL DEVICES
 SHERWOOD, OREGON

**FIGURE
16**

**LEGEND**

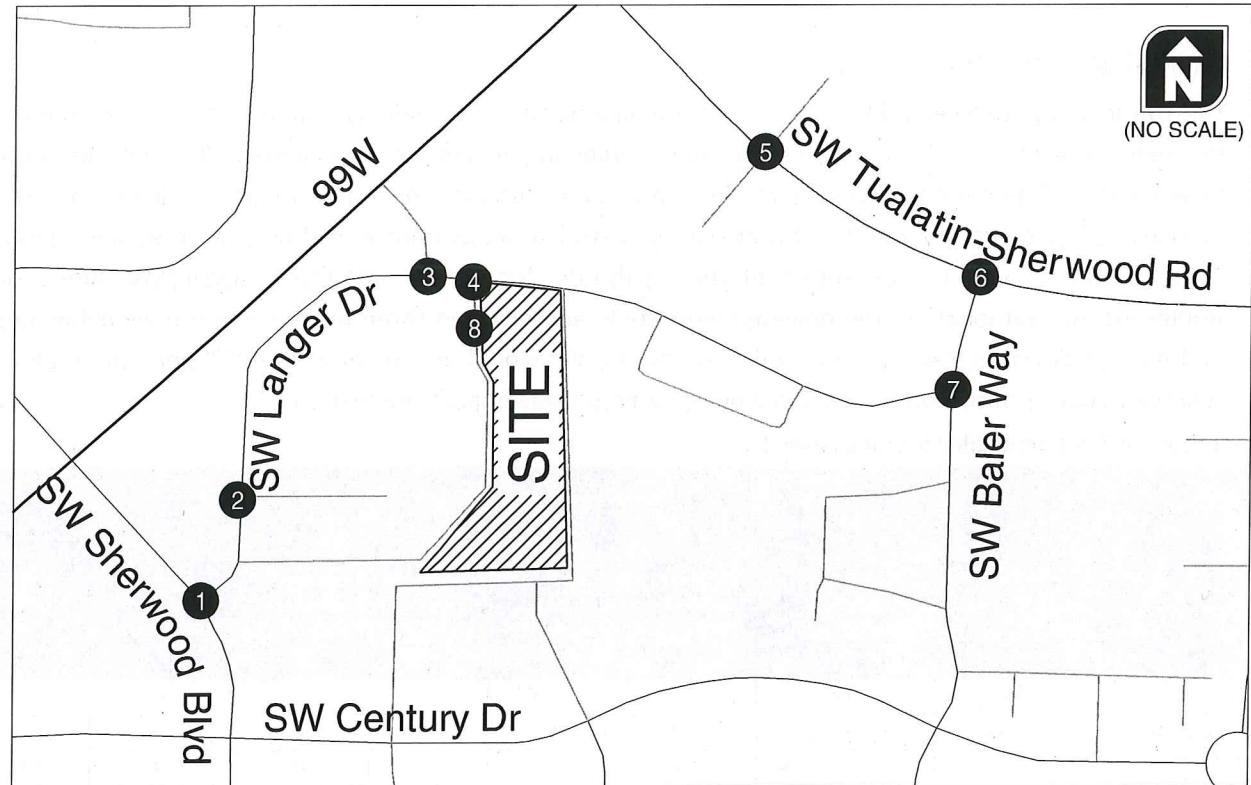
CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)

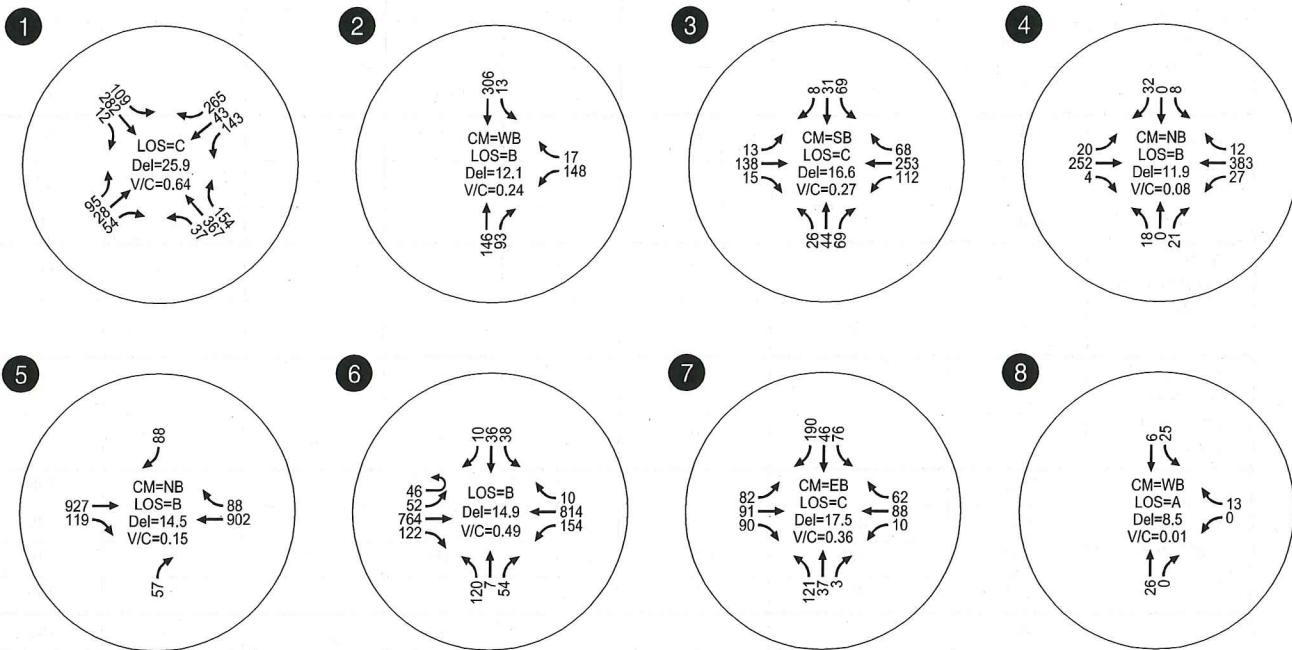
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

**YEAR 2016 TOTAL TRAFFIC CONDITIONS
WEEKDAY AM PEAK HOUR
SHERWOOD, OREGON**

**FIGURE
17**



N
(NO SCALE)

**LEGEND**

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE
(SIGNALIZED)/CRITICAL MOVEMENT LEVEL
OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY
(SIGNALIZED)/CRITICAL MOVEMENT CONTROL
DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2016 TOTAL TRAFFIC CONDITIONS
WEEKDAY PM PEAK HOUR
SHERWOOD, OREGON

FIGURE
18

QUEUEING ANALYSIS

The traffic analysis reviewed 95th percentile queueing during the weekday a.m. and p.m. peak hours at the eight study intersections to determine any queuing impacts of the development. **Table 9** shows the forecasted 95th percentile queueing at the eight study intersections. The results indicate that the forecast 95th percentile queue lengths at the eight study intersections would be able to be adequately accommodated, with the exception of the eastbound left at the SW Langer Drive/SW Sherwood Boulevard. At that location, the development would add one and three trips during the weekday a.m. and p.m. peak hours, respectively, which are negligible, would not increase the 95th percentile queue relative to background conditions and would not negatively impact the system.

Table 9: 95th Percentile Queueing Analysis

Intersection	Movement	95th Percentile Queue Length (feet)						Available Storage (feet)
		Weekday AM Peak Hour (Background)	Weekday PM Peak Hour (Background)	Weekday AM Peak Hour (Total Traffic)	Weekday PM Peak Hour (Total Traffic)	Weekday AM Peak (Difference)	Weekday PM Peak (Difference)	
SW Langer Drive/SW Sherwood Boulevard	EBL	#150	125	#150	125	0	0	100
	WBL	50	50	50	50	0	0	175
	NBL	100	100	100	100	0	0	100
	SBL	100	#175	100	#175	0	0	200
SW Langer Drive/Driveway on the north side of Dutch Bros.	WBL	25	25	25	25	0	0	75
	WBR	25	25	25	25	0	0	150
	SBR	25	25	25	25	0	0	100
SW Langer Drive/99W right-in/right-out access road	EBL	25	25	25	25	0	0	50
	WBL	25	25	25	25	0	0	50
	NBR	25	25	25	25	0	0	50
SW Langer Drive/Driveway west edge of site	EBL	25	25	25	25	0	0	50
	WBL	25	25	25	25	0	0	50
SW Tualatin-Sherwood Road/Theater Access	NBR	25	25	25	25	0	0	125
	SBR	25	25	25	25	0	0	100
SW Tualatin-Sherwood Road/SW Baler Way	EBL	25	50	25	50	0	0	200
	WBL	25	50	25	75	0	25	325
	NBL	100	150	100	#150	0	0	225
	SBL	25	75	25	75	0	0	200
SW Langer Drive/SW Baler Way	EBL	25	25	25	50	0	25	150
	WBL	25	25	25	25	0	0	100
	NBL	25	25	25	25	0	0	50
	SBL	25	25	25	25	0	0	125
Site Driveway	WBLR	N/A	N/A	25	25	N/A	N/A	75

All 95th percentile queue lengths rounded up to the nearest 25 feet.

EB: Eastbound, WB: Westbound, NB: Northbound, SB: Southbound

R: Right, L: Left, T: Through

95th percentile volume exceeds capacity, queue may be longer

SITE ACCESS AND SIGHT DISTANCE

The development would have two site access points. The proposed site access at the northwest corner of the property is located about 100 feet south of SW Langer Drive at the driveway at the west edge of the site. The sight distance at the access point at the intersection of SW Langer Drive is approximately 400 feet to the west and approximately 450 feet to the east. The site access point at the southwest corner of the property would provide access to the roadway behind Sherwood Plaza, where drivers could continue north towards SW Langer Drive or head west towards the Dutch Bros. drive-through coffee, which is also located on SW Langer Drive. Sight distance at the southwest access point is approximately 275 feet to the west and 325 feet to the north.

According to the City of Sherwood standard, sight distance at an intersection or a driveway must meet guidelines from the American Association of State Highway and Transportation Officials, *A Policy of Geometric Design of Highways and Streets 2004*, Fifth Edition, as described in Section 210.5 of the City of Sherwood Engineering Design Manual (Reference 7). Sight distance was measured in accordance with these guidelines, 15 feet from the near edge of the nearest lane of the intersecting street. **Table 10** shows the field measured sight distance at the access point.

Table 10: Estimated Intersection Sight Distance

Intersection	Measured Sight Distance - Facing Left (feet)	Measured Sight Distance - Facing Right (feet)	Speed (MPH) ¹	Minimum Intersection Sight Distance (feet) ²	Adequate?
SW Langer Drive & Driveway on the west edge of the site	400	450	25	280	Yes
Northwest access point	185	170	15	170	Yes
Southwest access point	275	325	15	170	Yes

¹ MPH = miles per hour

² Desired minimum sight distance based on AASHTO *A Policy on Geometric Design of Highways and Streets*, 5th Edition (based on AASHTO Case B2 and B3)

MULTI-MODAL CONNECTIVITY ANALYSIS

The sidewalks in the site vicinity connect the proposed site to SW Tualatin-Sherwood Road and to SW Sherwood Boulevard. There is a crosswalk connecting the south side of SW Langer Drive to the north side of SW Langer Drive within 100 feet of the proposed development's access point on SW Langer Drive. The existing bicycle lane in the study vicinity network is shown in **Figure 19** on the following page.

The need to develop infrastructures for bicycles and pedestrian to fill the system gaps is identified as the fourth goal of the *Sherwood Transportation System Plan* (Reference 1). The following projects are proposed in the *Sherwood Transportation System Plan* to improve the bicycle and pedestrian infrastructures in the site vicinity:

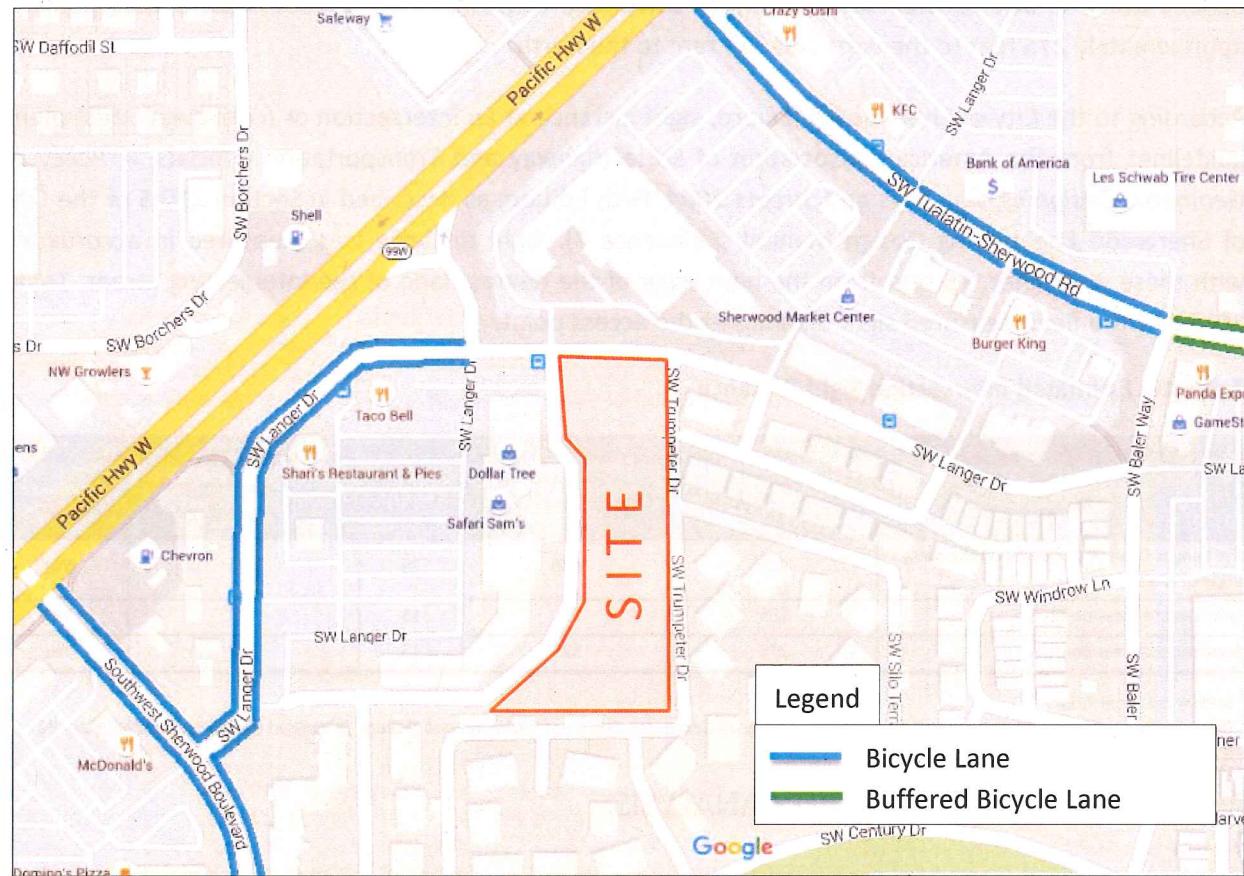
- #P6: Construct improvements to Sherwood Boulevard between Langer Drive and 3rd Street that are consistent with the Sherwood Town Center Plan. Major improvements would

include a shared-use path on the east side, wider sidewalks on the west side, narrower travel lanes, and landscaping.

- #B16: Rebuild SW Baler Way to a collector between Century Drive and SW Tualatin-Sherwood Road to include bike lanes.

Both of the above improvements are identified as short-term projects in the Sherwood TSP.

Figure 19: Existing Condition Bicycle Infrastructure



RECOMMENDATIONS

In accordance with the City of Sherwood Zoning and Community Development Code 16.90.030.D.6, the results of this study indicate that the proposed development can be developed while maintaining acceptable traffic operations and safety at the study intersections. The recommendation of this analysis and our recommendations are discussed below.

The following are the recommendations as part of this proposed development.

- Shrubbery and landscaping, as well as above ground utilities and signage near the site access points should be located and maintained to ensure adequate sight distance.

- To control traffic speeds and interactions with infrequently loading vehicles, speed bump installations along the south and east side of Sherwood Plaza should be considered.
- A sidewalk facility should be provided between the site and SW Langer Drive to facilitate pedestrian movements to/from the proposed development.
- The intersections of SW Langer Drive/99W right-in/right-out and SW Baler Way/SW Tualatin-Sherwood Road should be monitored by the City of Sherwood for potential traffic control modifications, if the historical safety problems persist.

REFERENCES

1. City of Sherwood. *Transportation System Plan*. 2014
2. Transportation Research Board. *2000 Highway Capacity Manual*. 2000.
3. Oregon Department of Transportation. *SPR 667 Assessment of Statewide Intersection Safety Performance*. June 2011.
4. ODOT Analysis Procedure Manual, Version 2, Chapter 4.
5. Langer Farms Transportation Impact Analysis. Kittelson & Associates, Inc., 2012.
6. Institute of Transportation Engineers. *Trip Generation, 9th Edition*. 2012.
7. City of Sherwood. *Engineering Design and Standard Detail Manual*. April 23, 2010

APPENDICES

- A. Scoping Emails
- B. Traffic Counts
- C. Year 2015 Existing Traffic Conditions Worksheets
- D. ODOT Crash Data
- E. Year 2016 Background Traffic Conditions Worksheets
- F. Year 2016 Total Traffic Conditions Worksheets

APPENDIX A: SCOPING EMAILS

Zachary Horowitz

From: Garth Appanaitis <gaa@dksassociates.com>
Sent: Wednesday, October 14, 2015 1:50 PM
To: Marc Butorac
Cc: Bob Galati; Mike Ard
Subject: Re: Sherwood Plaza Residential Scoping

Hi Marc,

Go ahead and assume the changes related to Washington County's TS Road project, including the control modifications at the theater signal on TS Road.

It looks like the existing conditions analysis that was done for that project was based on counts collected in early 2012, which predate the opening of Walmart. You'll need to collect new counts and manually shift some traffic based on the planned circulation near-term changes changes.

Let me know if you have any questions.

Thanks,
Garth

On Tue, Oct 13, 2015 at 9:25 AM, Garth Appanaitis <gaa@dksassociates.com> wrote:

Hi Marc,

I just wanted to follow up on our call from yesterday regarding the timing to the TS Road improvements and how that relates to the TIA for the residential use. I've left a message with Bob and I'm looking into some of the prior analysis that was done to see how old that data is now. I'll get back to you with an answer later today or tomorrow.

Thanks,
Garth

On Wed, Sep 30, 2015 at 8:03 AM, Garth Appanaitis <gaa@dksassociates.com> wrote:

Hi Mike,

The study intersections were marked as intended. It may be helpful to track the trips at the southernmost driveway near Dutch Bros on figures/tables, but operations analysis at this location is not needed. The primary access does still need to be included, and could have some trips added due to the turn restrictions at the Dutch Bros access.

When is the anticipated completion for the site?
Bob - what is the latest schedule on the TS Road improvements?

Thanks,
Garth

On Tue, Sep 29, 2015 at 5:35 PM, Mike Ard <mike@lancasterengineering.com> wrote:
Garth,

I have a couple of quick questions regarding the scope you provided:

1) I noticed that the primary west entrance to the shopping center is included in the analysis per your map; however the southwest access that serves the Goodwill donation center and the Dutch Bros. Coffee is not. I anticipate that the southwest access will accommodate site trips, while the primary shopping center access will see a negligible change in volume. Should the map be revised?

2) I see that the intersection of Tualatin Sherwood Road at the Cinema is included in the analysis scope. Is this intersection still scheduled for signal removal and conversion to right-in, right-out only? If this is going to happen in the near future it may not make sense to analyze the intersection. If we do analyze it we will need to know what assumptions to make regarding how the intersection will operate.

Thank you,

Michael Ard, PE
Lancaster Engineering
[\(503\)248-0313](tel:(503)248-0313)

On Tue, Sep 29, 2015 at 4:35 PM, Garth Appanaitis <gaa@dksassociates.com> wrote:
Marc - Here's the scoping summary we discussed along with the list of intersections:

- 7 study intersections - See list below.
- AM & PM peak hour intersection operations, queuing analysis (including 95th percentile), and crash analysis review
- As mentioned, Sherwood has a new code provision that was adopted last year with the TSP that includes looking at multimodal connectivity and crossing needs. This should be provided as well. Let me know if you need me to provide the specific requirements for this.

Study Intersections (see attached map):

- Langer/Sherwood Blvd,
- Langer/Driveway north side of Dutch Bros,
- Langer/99W RIRO access,
- Langer/ Driveway west edget of site,
- Langer/Baler
- TS Rd/Baler
- TS Rd/Theater access

Mike - This should be consistent with the voicemail I left you this morning (minus the specific intersection locations).

Let me know if you have any other questions or clarifications on the above items.

Thanks,
Garth

--

Garth Appanaitis, P.E. - Transportation Engineer

Zachary Horowitz

From: Garth Appanaitis <gaa@dkssassociates.com>
Sent: Monday, November 16, 2015 3:37 PM
To: Zachary Horowitz
Cc: Bob Galati
Subject: Re: Sherwood Plaza Residential Development TIA Questions

Bob - No action needed on your end. Just keeping you in the loop.

Zachary - Per our phone discussion on the remaining items:

1) Background Growth - 1.5% per year is fine.

2) Trip Distribution - Adjust your prior diagram to move 10% from west side of Sherwood Blvd to east side of TS at Baler Way. Updated distribution would have 10% to N/W Sherwood Blvd and 30% to TS Rd east of Baler.

3) Traffic Shifts with TS modifications - Generally shift traffic making lefts on the theater intersection (RIRO in future) to the Baler Way intersection.

Let me know if I missed anything.

Thanks,
Garth

On Fri, Nov 13, 2015 at 11:13 AM, Zachary Horowitz <zhorowitz@kittelson.com> wrote:

Hi Garth,

The only change I have from your email (highlighted in yellow, below) is that we are going to apply the same internalization (approximately 10%) and pass-by trip percentages (approximately 45%) that were used previously. These percentages will apply to **all** land uses (general retail, the drive-through bank, and the quality restaurant).

Thanks,

Zachary

From: Garth Appanaitis [mailto:gaa@dkssassociates.com]
Sent: Friday, November 13, 2015 11:03 AM
To: Zachary Horowitz
Cc: Bob Galati
Subject: Re: Sherwood Plaza Residential Development TIA Questions

Bob - No action needed on your part. Just copying you to keep you in the loop.

Zachary - Here's a recap of our phone call this morning regarding the items you had outlined below:

In Process Trips - Based on your visit to the Walmart site there is about 5800 SF of retail unoccupied, the Old Spaghetti Factory under construction, and an additional pad that you'll assume is a drive in bank. For the trip generation you'll use the same assumptions of no-passby for the bank and quality restaurant as assumed in the prior Walmart TIA for consistency. You'll determine the portion of unoccupied retail and apply that portion of trips from the prior study. For all these in-process trips you'll use the distribution from the prior study.

Assuming 2016 as year of opening is fine if that is the direction you are receiving from the client. I believe Marc or someone else had previously mentioned 2017 but it sounds like you have confirmed the 2016 date.

Background Growth / Distribution - We'll check the model and provide some information on Monday.

Circulation changes with reconfiguration at theater access - I'll see if I can track down the prior analysis that was done for TS Road and you can use those assumptions about circulation changes. If that material is not available, we can discuss another approach.

Let me know if there is anything I missed or that is not consistent with your understanding.

Thanks,
Garth

On Wed, Nov 11, 2015 at 2:24 PM, Zachary Horowitz <zhorowitz@kittelson.com> wrote:

Hi Garth,

One more question for you. Please take a look at the proposed trip distribution on the attached PDF and let me know if you agree with the pattern, or if you would like to make any changes. Thanks again.

Zachary

From: Zachary Horowitz
Sent: Wednesday, November 11, 2015 11:20 AM
To: 'Garth Appanaitis'
Cc: Bob Galati
Subject: RE: Sherwood Plaza Residential Development TIA Questions

Hi Garth,

Thanks again for your response. Our plan is to head out to the site tomorrow afternoon and take a look to see which retail spaces are unoccupied and/or which pads have not yet been built upon. I'll note our observations and confirm with you.

In regards to the background growth rate, the Walmart project used an annual rate of 1.5%. Do you agree that this rate would be appropriate to use for this current project?

Finally, I think the development will take about a year to complete, so we are going to use 2016 as the build-out year. Will that be ok?

Thanks,

Zachary

From: Garth Appanaitis [<mailto:gaa@dksassociates.com>]
Sent: Wednesday, November 11, 2015 7:45 AM
To: Zachary Horowitz
Cc: Bob Galati
Subject: Re: Sherwood Plaza Residential Development TIA Questions

Hi Zachary,

Unless you heard otherwise from Brad, I confirmed with Bob that the only in-process traffic to include are the unoccupied locations that were approved in the Walmart property. So take a look at what was approved for the site and has not opened yet.

The signal timing improvements would go hand in hand with the modifications to TS Road. Check with the County to see if you can get a copy of their assumed timings - Project Manager Dan Erpenbach at [503.846.7877](tel:503.846.7877) or daniel_erpenbach@co.washington.or.us.

Thanks,
Garth

On Tue, Nov 10, 2015 at 12:33 PM, Zachary Horowitz <zhorowitz@kittelson.com> wrote:

OK. I will assume that the TS Road improvements are in place for both the 'background' and 'with development' scenarios.

From: Garth Appanaitis [mailto:gaa@dksassociates.com]
Sent: Tuesday, November 10, 2015 12:32 PM
To: Zachary Horowitz
Cc: Bob Galati
Subject: Re: Sherwood Plaza Residential Development TIA Questions

Hi Zachary,

Based on previous direction (email to Marc B on 10/14) please assume that the TS Road improvements are in place. I'll forward the prior email for your reference.

Thanks,
Garth

On Tue, Nov 10, 2015 at 12:27 PM, Zachary Horowitz <zhorowitz@kittelson.com> wrote:

Hi Garth,

Thanks for your email.

One additional question about item #3 is when will the T-S Road improvements be completed? For the apartment development, we are looking at an analysis year of early 2017.

Zachary

From: Garth Appanaitis [mailto:gaa@dksassociates.com]
Sent: Tuesday, November 10, 2015 11:58 AM
To: Bob Galati
Cc: Zachary Horowitz
Subject: Sherwood Plaza Residential Development TIA Questions

Bob,

I got a call from Zachary with Kittelson yesterday (copied) asking a few questions about the TIA assumptions for the residential site behind Sherwood Plaza. We can chat about Items 1 and 4 today, but otherwise I just wanted to keep you in the loop with our coordination.

Zachary - Let me know if you are looking for anything else beyond the 4 items I outlined below.

- 1) In Process Trips - Are there any in process developments that would add trips to this area? I figured there may be some of the pads in Walmart and I noted I would check with Bob. I also referred Zachary to check with Brad.
- 2) Background Growth - We can provide this data from the TSP modeling.
- 3) TS Road Cross Section - See here for the concept layout. Let me know if there are other details you need, but some things may still be flushed out during design. <http://tsroadproject.com/wp-content/uploads/2012/03/Strip-Map-Web.pdf>
- 4) New Signal Timing - My understanding is that the final signal timing plans have not been developed. There were some assumptions used during the alternatives analysis, but final plans have not be developed by the

County. You may be able to request the draft timings from Washington County that were used in the prior analysis.

Thanks,
Garth

--

Garth Appanaitis, P.E. - Transportation Engineer

Ph: [503.243.3500](tel:503.243.3500) | F: [503.243.1934](tel:503.243.1934) | Email: gaa@dksassociates.com



www.dksassociates.com

This message contains information which may be confidential and privileged. Unless you are the addressee (or authorized to receive for the addressee), you may not use, copy, distribute or disclose to anyone this message or any information contained in or attached to this message. If you have received this message in error, please advise the sender and delete this message along with any attachments or links from your system.

--

Garth Appanaitis, P.E. - Transportation Engineer

Ph: [503.243.3500](tel:503.243.3500) | F: [503.243.1934](tel:503.243.1934) | Email: gaa@dksassociates.com



www.dksassociates.com

This message contains information which may be confidential and privileged. Unless you are the addressee (or authorized to receive for the addressee), you may not use, copy, distribute or disclose to anyone this message or any information contained in or attached to this message. If you have received this message in error, please advise the sender and delete this message along with any attachments or links from your system.

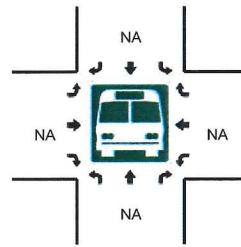
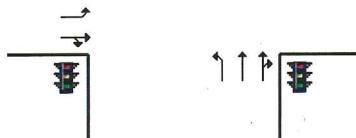
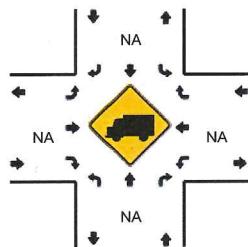
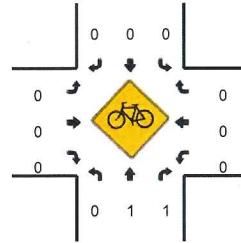
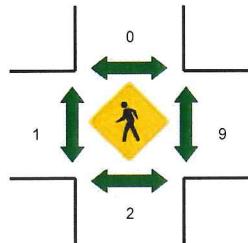
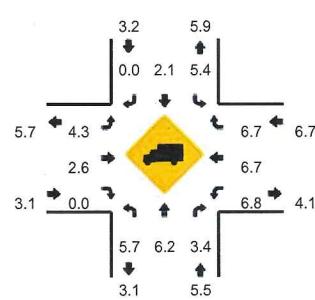
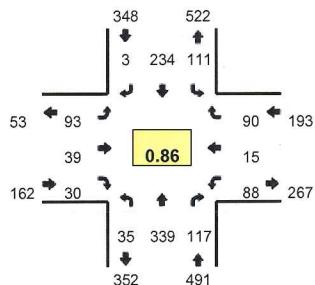
APPENDIX B: TRAFFIC COUNTS

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: SW Sherwood Blvd -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631601
DATE: Tue, Oct 27 2015



5-Min Count Period Beginning At	SW Sherwood Blvd (Northbound)				SW Sherwood Blvd (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	12	6	0	7	14	1	0	7	3	2	0	3	0	5	0	61	
7:05 AM	0	20	13	0	4	9	1	0	3	2	1	0	3	0	7	0	63	
7:10 AM	1	14	10	0	8	14	0	0	4	2	1	0	7	2	5	0	68	
7:15 AM	0	15	9	0	7	12	0	0	7	2	4	0	5	3	5	0	69	
7:20 AM	2	26	9	0	4	17	0	0	6	3	3	0	6	0	9	0	85	
7:25 AM	1	28	8	0	7	10	0	0	5	4	5	0	8	2	8	0	86	
7:30 AM	1	26	9	0	9	27	1	0	7	4	1	0	9	2	11	0	107	
7:35 AM	6	25	3	0	7	22	0	0	8	1	2	0	11	2	7	0	94	
7:40 AM	2	32	21	0	9	27	0	0	10	5	2	0	9	0	10	0	127	
7:45 AM	3	35	5	0	7	31	0	0	6	5	1	0	11	1	7	0	112	
7:50 AM	5	39	6	0	13	16	1	0	9	3	3	0	7	1	4	0	107	
7:55 AM	7	36	16	0	13	22	0	0	7	5	2	0	8	1	5	0	122	1101
8:00 AM	4	40	13	0	13	23	0	0	4	1	2	0	5	1	5	0	111	1151
8:05 AM	3	22	9	0	12	11	0	0	9	2	4	0	5	0	11	0	88	1176
8:10 AM	1	15	9	0	10	16	1	0	15	4	1	0	4	2	8	0	86	1194
8:15 AM	2	17	4	0	6	12	0	0	3	1	3	0	5	2	6	0	61	1186
8:20 AM	4	17	4	0	9	11	0	0	1	2	4	0	3	3	1	0	59	1160
8:25 AM	2	14	7	0	3	10	0	0	6	3	2	0	2	1	7	0	57	1131
8:30 AM	1	16	4	0	6	12	0	0	7	0	3	0	4	0	10	0	63	1087
8:35 AM	2	16	8	0	12	15	0	0	4	1	2	0	5	0	6	0	71	1064
8:40 AM	0	21	10	0	5	17	1	0	5	1	4	0	0	5	10	0	79	1016
8:45 AM	2	16	9	0	5	10	2	0	2	4	2	0	5	3	9	0	69	973
8:50 AM	3	18	5	0	6	13	0	0	5	2	3	0	7	1	10	0	73	939
8:55 AM	1	11	16	0	11	9	2	0	8	0	2	0	5	1	6	0	72	889
Peak 15-Min Flowrates		Northbound				Southbound				Eastbound				Westbound				
		Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total
All Vehicles	40	424	128	0	116	296	4	0	100	52	24	0	108	8	84	0	1384	
Heavy Trucks	0	36	8	0	4	8	0	0	4	0	0	0	0	0	0	0	60	
Pedestrians		0				0				0				8			8	
Bicycles		0				0				0				5			1	
Railroad		0				0				0				0			0	
Stopped Buses		0				0				0				0			0	

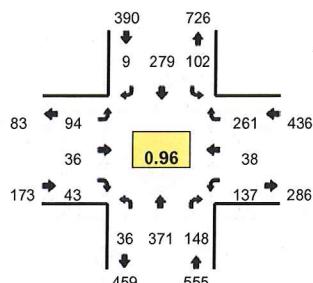
Comments:

Type of peak hour being reported: Intersection Peak

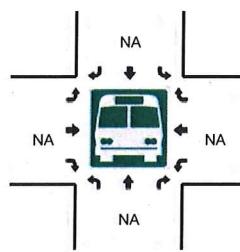
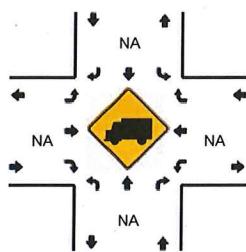
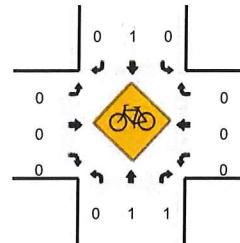
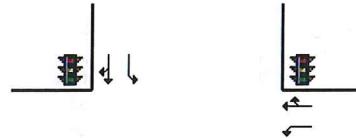
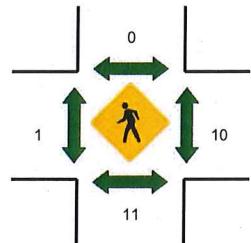
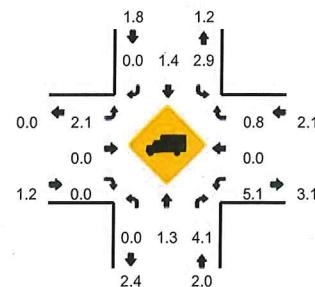
Method for determining peak hour: Total Entering Volume

LOCATION: SW Sherwood Blvd -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631602
DATE: Tue, Oct 27 2015



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM



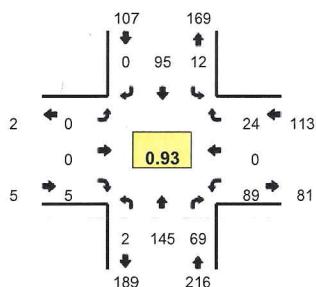
5-Min Count Period Beginning At	SW Sherwood Blvd (Northbound)				SW Sherwood Blvd (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	18	11	0	11	24	0	0	2	2	3	0	12	6	15	0	107	
4:05 PM	1	29	18	0	12	16	3	0	6	1	2	0	10	2	18	0	118	
4:10 PM	2	22	11	0	15	13	0	0	10	2	9	0	12	5	24	0	125	
4:15 PM	2	25	19	0	11	19	1	0	2	1	3	0	10	4	31	0	128	
4:20 PM	5	21	10	0	20	11	0	0	9	1	5	0	12	3	23	0	120	
4:25 PM	5	10	16	0	13	23	2	0	8	3	4	0	10	5	19	0	118	
4:30 PM	3	31	12	0	10	18	1	0	9	3	4	0	16	4	19	0	130	
4:35 PM	5	26	8	0	9	25	0	0	5	4	1	0	9	4	15	0	111	
4:40 PM	5	31	14	0	8	16	2	0	10	2	4	0	20	2	17	0	131	
4:45 PM	3	39	16	0	9	26	0	0	11	3	3	0	8	1	16	0	135	
4:50 PM	1	29	15	0	7	17	2	0	14	8	6	0	11	2	25	0	137	
4:55 PM	1	30	7	0	11	19	0	0	3	0	5	0	14	2	34	0	126	1486
5:00 PM	1	23	10	0	11	18	2	0	5	3	3	0	10	7	22	0	115	1494
5:05 PM	5	37	18	0	3	26	1	0	7	4	4	0	13	2	21	0	141	1517
5:10 PM	1	41	10	0	8	23	0	0	13	1	4	0	10	6	21	0	138	1530
5:15 PM	1	29	10	0	3	25	0	0	8	3	1	0	16	2	16	0	114	1516
5:20 PM	3	32	13	0	6	24	0	0	6	1	3	0	11	6	23	0	128	1524
5:25 PM	1	26	14	0	10	28	0	0	6	1	3	0	11	1	14	0	115	1521
5:30 PM	2	27	10	0	11	32	1	0	6	5	4	0	10	3	21	0	132	1523
5:35 PM	8	25	12	0	12	21	1	0	8	2	3	0	18	2	22	0	134	1546
5:40 PM	9	33	13	0	11	20	2	0	7	5	4	0	5	4	26	0	139	1554
5:45 PM	2	25	12	0	6	19	2	0	16	3	10	0	12	4	22	0	133	1552
5:50 PM	2	27	18	0	12	17	3	0	9	0	9	0	8	3	17	0	125	1540
5:55 PM	3	32	9	0	6	21	3	0	7	1	4	0	13	7	30	0	136	1550
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	76	340	140	0	136	292	16	0	84	48	44	0	132	36	276	0	1620	
Heavy Trucks	0	16	0	0	4	0	0	0	0	0	0	0	8	0	0	0	28	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Railroad																		
Stopped Buses																		
<i>Comments:</i>																		

Type of peak hour being reported: Intersection Peak

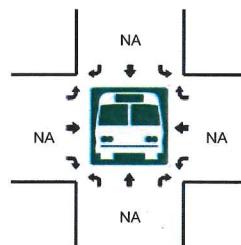
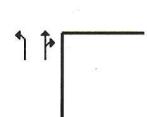
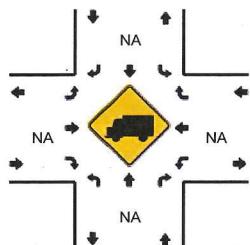
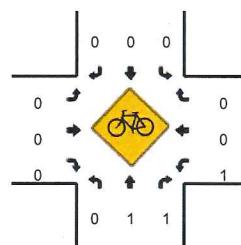
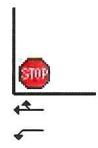
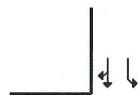
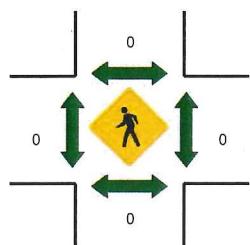
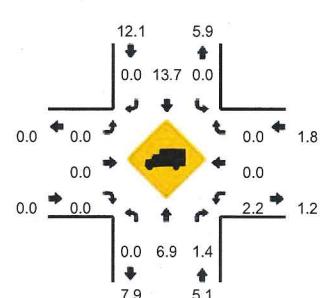
Method for determining peak hour: Total Entering Volume

LOCATION: SW Langer Dr -- Dwy North Of Dutch Bros
CITY/STATE: Sherwood, OR

QC JOB #: 13631603
DATE: Tue, Oct 27 2015



Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:25 AM -- 7:40 AM



5-Min Count Period	SW Langer Dr (Northbound)				SW Langer Dr (Southbound)				Dwy North Of Dutch Bros (Eastbound)				Dwy North Of Dutch Bros (Westbound)				Total	Hourly Totals	
	Beginning At	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	7	2	0		0	4	0	0	0	0	1	0	5	0	0	0	19	
7:05 AM	1	11	1	0		1	6	0	0	0	0	1	0	7	0	2	0	30	
7:10 AM	0	8	2	0		1	7	0	0	0	0	0	0	3	0	2	0	23	
7:15 AM	0	7	7	0		2	7	0	0	0	0	0	0	8	0	2	0	33	
7:20 AM	0	6	5	0		2	6	0	0	0	0	0	0	6	0	2	0	27	
7:25 AM	0	15	5	0		1	7	0	0	0	0	3	0	14	0	1	0	46	
7:30 AM	0	10	7	0		0	12	0	0	0	0	1	0	11	0	1	0	42	
7:35 AM	0	10	2	0		2	9	0	0	0	0	0	0	6	0	1	0	30	
7:40 AM	0	19	11	0		0	8	0	0	0	0	1	0	6	0	1	0	46	
7:45 AM	1	11	4	0		2	16	0	0	0	0	0	0	3	0	2	0	39	
7:50 AM	0	10	6	0		0	5	0	0	0	0	0	0	5	0	3	0	29	
7:55 AM	1	11	8	0		2	7	0	0	0	0	0	0	6	0	4	0	39	403
8:00 AM	0	14	8	0		0	5	0	0	0	0	0	0	9	0	5	0	41	425
8:05 AM	0	16	4	0		1	5	0	0	0	0	0	0	10	0	1	0	37	432
8:10 AM	0	16	2	0		0	8	0	0	0	0	0	0	5	0	1	0	32	441
8:15 AM	0	7	2	0		0	4	0	0	0	0	1	0	5	0	3	0	22	430
8:20 AM	0	11	3	0		1	8	0	0	0	0	0	0	2	0	3	0	28	431
8:25 AM	0	4	4	0		1	8	0	0	0	0	0	0	2	0	1	0	20	405
8:30 AM	0	3	2	0		1	10	0	0	0	0	1	0	3	0	3	0	23	386
8:35 AM	0	8	4	0		0	5	0	0	0	0	0	0	5	0	3	0	25	381
8:40 AM	0	7	4	0		1	9	0	0	0	0	0	0	9	0	3	0	33	368
8:45 AM	0	11	3	0		0	8	0	0	0	0	0	0	8	0	1	0	31	360
8:50 AM	0	8	5	0		0	11	0	0	0	0	0	0	6	0	0	0	30	361
8:55 AM	1	7	4	0		1	8	0	0	0	0	0	0	3	0	1	0	25	347
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
All Vehicles	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total		
All Vehicles	0	140	56	0	12	112	0	0	0	0	16	0	124	0	12	0	472		
Heavy Trucks	0	4	0		0	16	0	0	0	0	0	0	4	0	0	0	24		
Pedestrians	0				0				0				0				0		
Bicycles	0				0				0				0				0		
Railroad																	0		
Stopped Buses																	0		

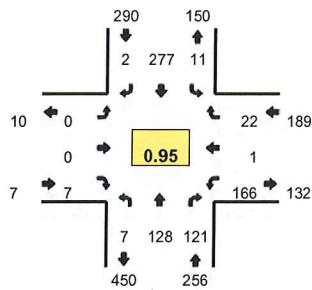
Comments:

Type of peak hour being reported: Intersection Peak

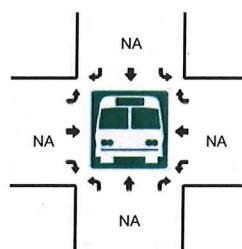
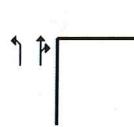
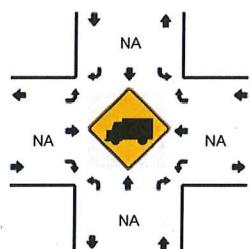
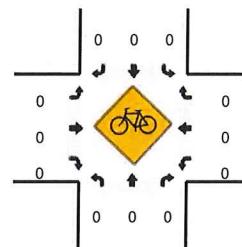
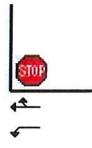
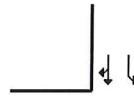
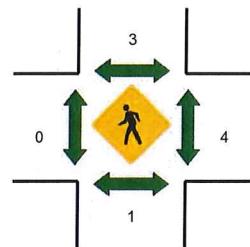
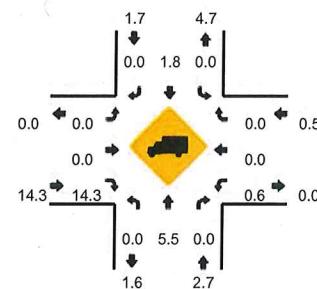
Method for determining peak hour: Total Entering Volume

LOCATION: SW Langer Dr -- Dwy North Of Dutch Bros
CITY/STATE: Sherwood, OR

QC JOB #: 13631604
DATE: Tue, Oct 27 2015



Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:10 PM -- 4:25 PM



5-Min Count Period	SW Langer Dr (Northbound)				SW Langer Dr (Southbound)				Dwy North Of Dutch Bros (Eastbound)				Dwy North Of Dutch Bros (Westbound)				Total	Hourly Totals	
	Beginning At	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	13	6	0	1	19	0	0	0	0	0	0	0	6	0	1	0	46	
4:05 PM	0	13	7	0	0	17	0	0	0	0	0	0	0	15	0	1	0	53	
4:10 PM	0	14	12	0	1	32	0	0	0	0	0	1	0	12	0	3	0	75	
4:15 PM	0	10	12	0	0	26	0	0	0	0	0	1	0	16	0	0	0	65	
4:20 PM	1	5	14	0	1	19	0	0	0	0	0	0	0	15	0	1	0	56	
4:25 PM	2	13	10	0	3	26	0	0	0	0	0	0	0	15	0	1	0	70	
4:30 PM	0	7	12	0	0	15	1	0	0	0	0	0	0	13	0	4	0	52	
4:35 PM	0	8	14	0	0	27	0	0	0	0	0	1	0	10	0	3	0	63	
4:40 PM	0	9	9	0	2	19	0	0	0	0	0	2	0	8	0	3	0	52	
4:45 PM	0	14	10	0	1	21	1	0	0	0	0	1	0	9	0	2	0	59	
4:50 PM	2	16	6	0	3	14	0	0	0	0	0	0	0	20	0	1	0	62	
4:55 PM	0	6	6	0	0	31	0	0	0	0	0	0	0	23	0	1	0	67	720
5:00 PM	0	14	12	0	0	26	0	0	0	0	0	1	0	8	1	2	0	64	738
5:05 PM	2	12	4	0	0	21	0	0	0	0	0	0	0	17	0	1	0	57	742
5:10 PM	0	9	9	0	1	26	0	0	0	1	0	1	0	7	0	1	0	55	722
5:15 PM	0	11	3	0	2	24	0	0	1	0	2	0	0	12	0	1	0	56	713
5:20 PM	0	9	3	0	0	22	0	0	0	0	0	0	0	9	0	3	0	46	703
5:25 PM	0	11	10	0	2	16	0	0	0	0	0	0	0	9	0	1	0	49	682
5:30 PM	0	14	11	0	0	28	0	0	0	0	0	1	0	11	0	0	0	65	695
5:35 PM	0	12	4	0	3	33	0	0	0	0	0	0	0	10	0	3	0	65	697
5:40 PM	0	11	9	0	0	26	0	0	0	0	0	0	0	13	0	1	0	60	705
5:45 PM	1	18	7	0	2	22	0	0	0	0	0	1	0	14	0	0	0	65	711
5:50 PM	0	17	6	0	3	26	0	0	0	0	0	0	0	8	0	3	0	63	712
5:55 PM	0	7	4	0	2	27	0	0	0	0	0	1	0	13	0	2	0	56	701
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	4	116	152	0	8	308	0	0	0	0	8	0	172	0	16	0	784		
Heavy Trucks	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0	0	12		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Comments:

Report generated on 11/5/2015 2:31 PM

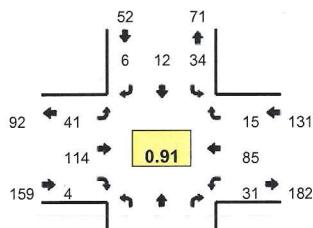
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

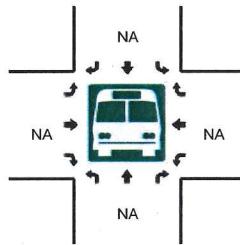
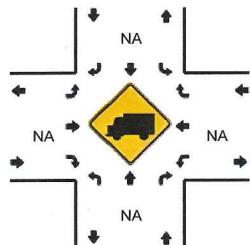
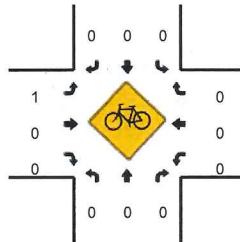
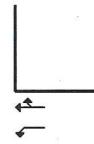
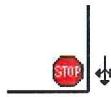
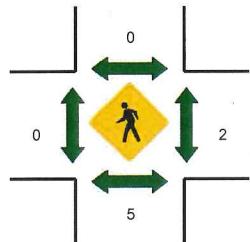
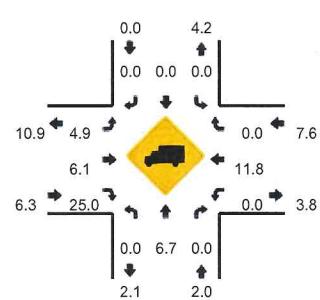
Method for determining peak hour: Total Entering Volume

LOCATION: 99W RIRO Access -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631605
DATE: Tue, Oct 27 2015



Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:40 AM -- 7:55 AM



5-Min Count Period	99W RIRO Access (Northbound)				99W RIRO Access (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	1	1	0	3	0	0	0	1	8	0	0	2	3	0	0	19	
7:05 AM	0	1	2	0	2	0	0	0	2	11	0	0	3	9	1	0	31	
7:10 AM	1	0	0	0	2	0	0	0	2	8	0	0	1	2	1	0	17	
7:15 AM	0	1	0	0	1	0	1	0	1	3	0	0	3	6	1	0	17	
7:20 AM	1	1	2	0	2	1	0	0	4	7	0	0	2	7	1	0	28	
7:25 AM	0	2	2	0	2	1	1	0	3	3	1	0	6	6	1	0	28	
7:30 AM	0	1	0	0	0	2	0	0	5	9	0	0	1	6	3	0	27	
7:35 AM	0	2	0	0	2	0	0	0	1	5	0	0	2	10	1	0	23	
7:40 AM	0	0	1	0	3	1	0	0	5	18	0	0	2	7	0	0	37	
7:45 AM	1	0	1	0	3	0	1	0	3	5	1	0	1	15	2	0	33	
7:50 AM	0	3	6	0	2	2	0	0	5	10	0	0	2	8	0	0	38	
7:55 AM	0	1	3	0	5	1	1	0	2	10	0	0	4	7	1	0	35	333
8:00 AM	0	1	7	0	3	0	1	0	4	12	1	0	1	5	0	0	35	349
8:05 AM	0	3	6	0	4	0	1	0	2	13	1	0	3	4	1	0	38	356
8:10 AM	0	0	3	0	2	2	0	0	1	13	0	0	2	5	3	0	31	370
8:15 AM	0	2	3	0	5	2	0	0	7	4	0	0	5	5	0	0	33	386
8:20 AM	0	0	2	0	3	1	1	0	3	12	0	0	2	7	3	0	34	392
8:25 AM	1	0	2	0	2	0	0	0	1	3	1	0	3	6	0	0	19	383
8:30 AM	0	1	1	0	2	0	0	0	2	3	0	0	1	9	1	0	20	376
8:35 AM	0	2	4	0	2	0	0	0	2	6	3	0	2	6	2	0	29	382
8:40 AM	0	2	3	0	1	0	1	0	4	5	0	0	4	8	0	0	28	373
8:45 AM	0	0	3	0	3	0	0	0	1	10	0	0	2	7	1	0	27	367
8:50 AM	0	1	1	0	2	1	0	0	1	8	0	0	1	10	0	0	25	354
8:55 AM	0	1	2	0	1	0	1	0	1	4	1	0	5	4	1	0	21	340
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	12	32	0	32	12	4	0	52	132	4	0	20	120	8	0	432	
Heavy Trucks	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

Report generated on 11/5/2015 2:31 PM

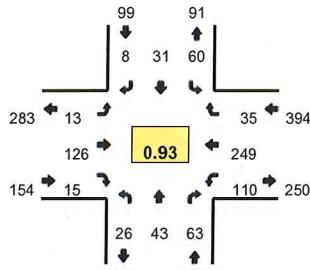
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

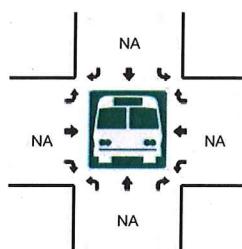
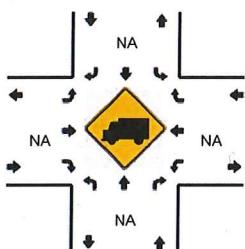
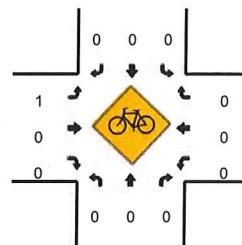
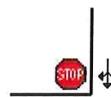
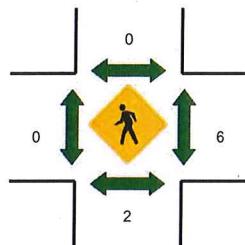
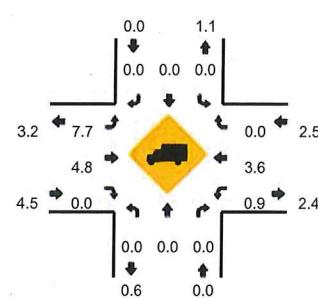
Method for determining peak hour: Total Entering Volume

LOCATION: 99W RIRO Access -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631606
DATE: Tue, Oct 27 2015



Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:35 PM -- 5:50 PM



5-Min Count Period Beginning At	99W RIRO Access (Northbound)				99W RIRO Access (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	3	5	0	1	3	0	0	3	7	2	0	9	19	4	0	56	
4:05 PM	2	5	9	0	4	3	0	0	5	12	0	0	11	13	0	0	64	
4:10 PM	2	1	3	0	3	2	0	0	0	9	0	0	5	30	0	0	55	
4:15 PM	0	3	12	0	4	6	1	0	2	13	1	0	7	25	2	0	76	
4:20 PM	3	8	4	0	3	3	0	0	1	2	3	0	5	18	0	0	50	
4:25 PM	4	0	3	0	4	3	0	0	0	7	0	0	9	16	2	0	48	
4:30 PM	2	4	7	0	2	6	0	0	3	10	1	0	6	21	2	0	64	
4:35 PM	1	6	12	0	2	5	0	0	0	8	0	0	8	21	3	0	66	
4:40 PM	3	4	5	0	6	5	1	0	2	9	0	0	6	13	1	0	55	
4:45 PM	1	2	7	0	3	4	0	0	3	13	5	0	8	21	3	0	70	
4:50 PM	1	0	5	0	8	4	0	0	2	13	0	0	6	17	5	0	61	
4:55 PM	2	5	4	0	6	2	1	0	0	8	2	0	11	26	3	0	70	735
5:00 PM	1	5	3	0	4	2	0	0	1	7	1	0	8	22	9	0	63	742
5:05 PM	1	4	12	0	5	4	0	0	0	16	2	0	5	14	2	0	65	743
5:10 PM	2	1	3	0	4	1	0	0	0	5	1	0	12	21	3	0	53	741
5:15 PM	3	4	7	0	4	2	1	0	1	5	0	0	6	23	1	1	58	723
5:20 PM	0	7	4	0	4	3	0	0	2	15	2	0	10	21	2	0	70	743
5:25 PM	2	4	4	0	5	4	1	0	0	11	1	0	6	15	2	0	55	750
5:30 PM	3	2	2	0	3	3	0	0	1	10	1	0	11	21	2	0	59	745
5:35 PM	5	3	5	0	8	3	4	0	3	12	1	0	7	24	3	0	78	757
5:40 PM	2	4	7	0	2	2	0	0	0	10	1	0	10	25	3	0	66	768
5:45 PM	3	2	4	0	7	1	0	0	0	10	1	0	16	20	1	0	65	763
5:50 PM	2	2	8	0	8	4	1	0	5	17	2	0	7	17	4	0	77	779
5:55 PM	2	2	8	0	4	4	0	0	3	6	1	0	9	28	2	0	69	778
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound					
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	40	36	64	0	68	24	16	0	12	128	12	0	132	276	28	0	836	
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	12	
Pedestrians	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Comments:

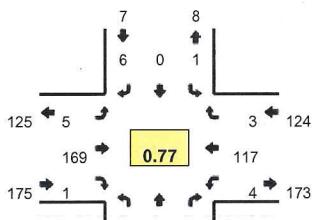
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

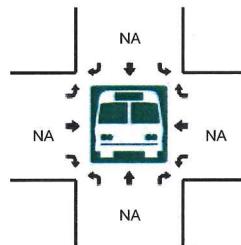
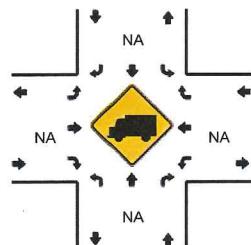
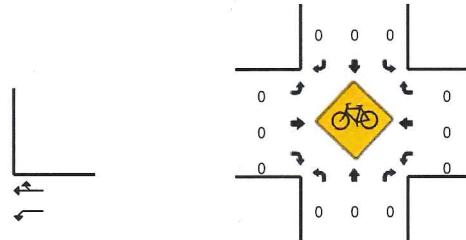
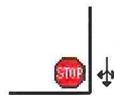
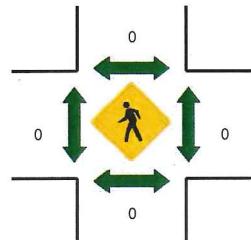
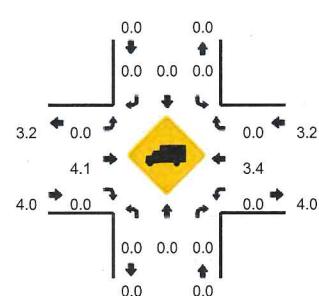
LOCATION: West Site Dwy -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631607

DATE: Thu, Oct 29 2015



Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



5-Min Count Period Beginning At	West Site Dwy (Northbound)				West Site Dwy (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	0	0	0	0	0	0	0	1	8	0	0	0	8	0	0	0	17	
7:05 AM	0	0	1	0	0	0	0	0	0	10	0	0	0	6	0	0	0	17	
7:10 AM	0	0	0	0	0	0	0	0	2	5	0	0	0	3	0	0	0	10	
7:15 AM	0	0	0	0	0	0	1	0	0	9	0	0	0	6	0	0	0	16	
7:20 AM	0	0	1	0	0	0	0	0	0	9	0	0	0	6	0	0	0	16	
7:25 AM	0	0	0	0	0	0	0	0	1	7	0	0	1	10	0	0	0	19	
7:30 AM	0	0	0	0	0	0	0	0	0	11	0	0	1	7	0	0	0	19	
7:35 AM	2	0	0	0	0	0	0	0	0	9	0	0	0	13	0	0	0	24	
7:40 AM	0	0	1	0	0	0	0	0	1	12	0	0	0	12	1	0	0	27	
7:45 AM	0	0	0	0	0	0	0	0	1	17	0	0	0	13	0	0	0	31	
7:50 AM	0	0	1	0	0	0	0	0	1	16	0	0	0	13	1	0	0	32	
7:55 AM	0	0	0	0	0	0	2	0	0	23	1	0	0	11	1	0	0	38	
8:00 AM	0	0	0	0	0	0	1	0	0	19	0	0	0	7	0	0	0	27	
8:05 AM	0	0	1	0	1	0	1	0	1	20	0	0	1	10	0	0	0	35	
8:10 AM	0	0	0	0	0	0	0	0	0	13	0	0	0	7	0	0	0	20	
8:15 AM	0	0	0	0	0	0	2	0	0	9	0	0	1	8	0	0	0	20	
8:20 AM	0	0	0	0	0	0	0	0	0	13	0	0	0	6	0	0	0	308	
8:25 AM	0	0	0	0	0	0	2	0	1	7	0	0	0	7	0	0	0	309	
8:30 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	2	0	0	0	13	
8:35 AM	0	0	0	0	0	0	0	0	0	13	0	0	0	6	1	0	0	299	
8:40 AM	0	0	1	0	0	0	0	0	1	13	0	0	0	4	0	0	0	291	
8:45 AM	0	0	0	0	0	0	1	0	0	7	0	0	0	7	1	0	0	16	
8:50 AM	0	0	0	0	1	0	1	0	1	12	0	0	0	8	0	0	0	267	
8:55 AM	0	1	0	0	0	0	1	0	0	11	0	0	0	11	0	0	0	24	
Peak 15-Min Flowrates		Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	0	0	4	0	0	0	8	0	8	224	4	0	0	148	8	0	0	404	
Heavy Trucks	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

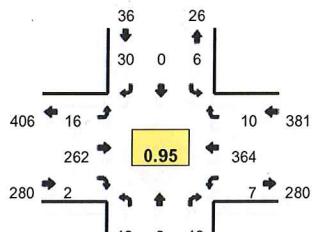
Comments:

Type of peak hour being reported: Intersection Peak

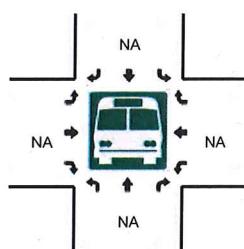
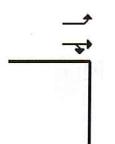
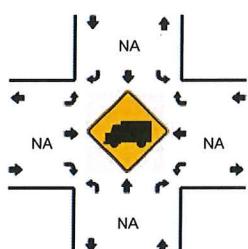
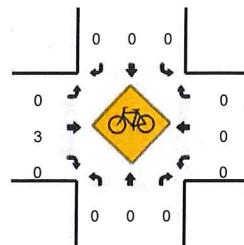
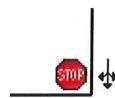
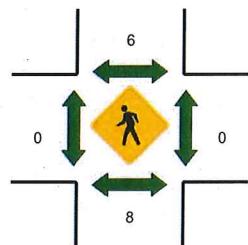
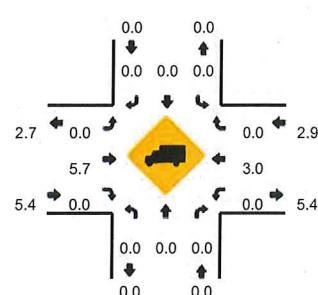
Method for determining peak hour: Total Entering Volume

LOCATION: West Site Dwy -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631608
DATE: Thu, Oct 29 2015



Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



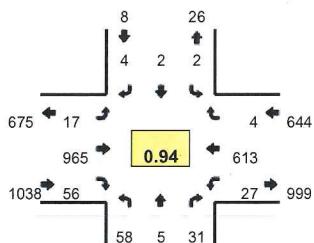
5-Min Count Period	West Site Dwy (Northbound)				West Site Dwy (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals	
	Beginning At	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM		0	0	0	0	0	0	1	0	0	17	0	0	2	21	0	0	41	
4:05 PM		0	0	1	0	1	0	4	0	1	17	0	0	2	28	1	0	55	
4:10 PM		0	0	1	0	1	0	3	0	0	14	0	0	0	21	0	0	40	
4:15 PM		0	0	1	0	0	0	2	0	2	14	0	0	1	29	0	0	49	
4:20 PM		1	0	1	0	0	0	2	0	0	16	0	0	0	28	0	0	48	
4:25 PM		0	0	0	0	0	0	4	0	2	25	0	0	0	26	0	0	57	
4:30 PM		0	0	0	0	2	0	3	0	0	15	0	0	0	41	2	0	63	
4:35 PM		1	0	2	0	0	0	1	0	3	21	1	0	0	26	0	0	55	
4:40 PM		2	0	2	0	0	0	2	0	2	32	0	0	0	22	1	0	63	
4:45 PM		0	0	2	0	1	0	0	0	2	23	0	0	2	34	1	0	65	
4:50 PM		2	0	0	0	0	0	1	0	2	17	0	0	1	33	1	0	57	
4:55 PM		1	0	1	0	1	0	3	0	1	26	0	0	1	33	0	0	67	660
5:00 PM		1	0	1	0	0	0	6	0	1	22	0	0	0	32	2	0	65	684
5:05 PM		0	0	1	0	2	0	4	0	1	19	0	0	1	29	0	0	57	686
5:10 PM		2	0	0	0	0	0	4	0	0	22	1	0	1	34	1	0	65	711
5:15 PM		2	0	0	0	0	0	1	0	0	26	0	0	0	28	0	0	57	719
5:20 PM		0	0	2	0	0	0	0	5	0	20	0	0	0	16	1	0	44	715
5:25 PM		1	0	1	0	0	0	0	0	4	19	0	0	1	36	1	0	63	721
5:30 PM		0	0	2	0	0	0	1	0	1	14	0	0	1	25	0	0	44	702
5:35 PM		3	0	0	0	2	0	4	0	2	23	0	0	0	25	0	0	59	706
5:40 PM		3	0	0	0	1	0	2	0	4	21	0	0	0	25	3	0	59	702
5:45 PM		1	0	2	0	2	0	1	0	5	20	0	0	0	37	0	0	68	705
5:50 PM		2	0	0	0	0	0	1	0	1	16	0	0	0	22	4	0	46	694
5:55 PM		3	0	2	0	0	0	3	0	2	26	0	0	0	29	0	0	65	692
Peak 15-Min Flowrates		Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
Heavy Trucks	12	0	12	0	8	0	16	0	20	264	0	0	16	400	8	0	756		
Pedestrians	0	0	0	0	0	0	0	0	0	12	0	0	0	8	0	0	20		
Bicycles	8	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	12		
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Stopped Buses																			
<i>Comments:</i>																			

Type of peak hour being reported: Intersection Peak

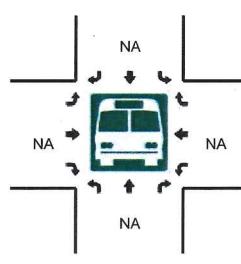
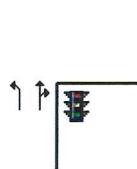
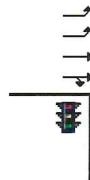
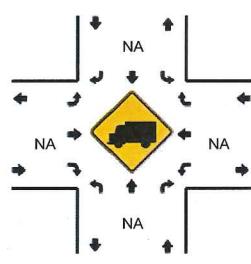
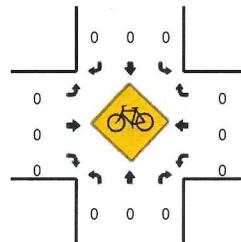
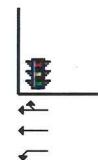
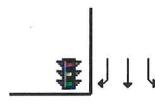
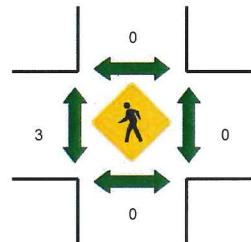
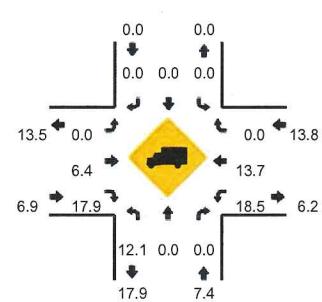
Method for determining peak hour: Total Entering Volume

LOCATION: Theater Access -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

QC JOB #: 13631613
DATE: Tue, Oct 27 2015



Peak-Hour: 7:10 AM -- 8:10 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



5-Min Count Period Beginning At	Theater Access (Northbound)				Theater Access (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	0	0	0	0	0	0	0	58	2	0	1	44	0	0	108	
7:05 AM	3	0	0	0	0	0	0	0	3	71	4	0	1	34	0	0	117	
7:10 AM	7	1	2	0	0	1	0	0	6	85	4	0	2	46	0	0	154	
7:15 AM	4	1	2	0	1	0	0	0	2	87	7	0	2	60	0	0	166	
7:20 AM	7	1	1	0	0	1	1	0	2	76	3	0	1	57	0	0	150	
7:25 AM	6	0	4	0	0	0	0	0	0	86	8	0	2	31	0	0	137	
7:30 AM	6	0	3	0	0	0	0	0	0	68	2	0	6	57	1	0	143	
7:35 AM	0	0	1	0	0	0	0	0	0	75	6	0	2	44	0	0	128	
7:40 AM	10	2	2	0	0	0	0	0	1	78	2	0	4	52	0	0	151	
7:45 AM	1	0	3	0	0	0	1	0	1	90	3	0	4	60	1	1	165	
7:50 AM	10	0	6	0	1	0	1	0	3	75	5	0	1	52	0	0	154	
7:55 AM	4	0	1	0	0	0	0	0	0	82	6	0	0	63	0	0	156	1729
8:00 AM	2	0	2	0	0	0	0	0	1	68	3	0	2	44	1	0	123	1744
8:05 AM	1	0	4	0	0	0	1	0	1	95	7	0	0	47	1	0	157	1784
8:10 AM	3	0	1	0	0	0	0	0	4	89	7	0	4	45	1	0	154	1784
8:15 AM	8	0	1	0	1	0	0	0	2	75	0	0	2	49	1	0	139	1757
8:20 AM	5	2	2	0	0	0	1	0	2	54	7	0	3	52	2	0	130	1737
8:25 AM	7	0	3	0	0	0	0	0	2	70	8	0	2	51	2	0	145	1745
8:30 AM	1	0	1	0	0	2	1	0	3	42	5	0	0	38	0	0	93	1695
8:35 AM	2	2	1	0	0	0	0	0	2	87	7	0	3	58	0	0	162	1729
8:40 AM	3	0	6	0	1	2	1	0	2	62	7	0	3	63	1	0	151	1729
8:45 AM	2	0	2	0	0	0	0	0	0	73	2	0	4	61	0	0	144	1708
8:50 AM	2	1	1	0	0	0	1	0	2	47	4	0	2	53	1	0	114	1668
8:55 AM	5	0	3	0	2	1	2	0	1	72	8	0	0	27	1	0	122	1634
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
All Vehicles	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
Heavy Trucks	60	0	40	0	4	0	8	0	16	988	56	0	20	700	4	4	1900	
Pedestrians	8	0	0	0	0	0	0	0	0	52	8	0	0	92	0	0	160	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

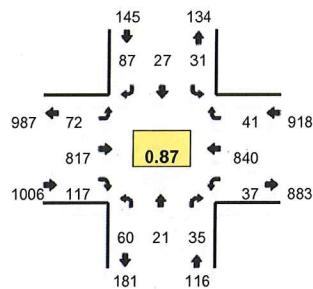
Comments:

Type of peak hour being reported: Intersection Peak

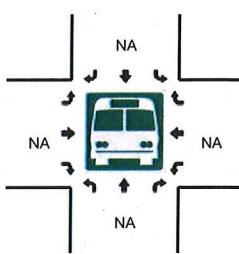
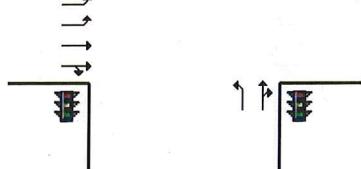
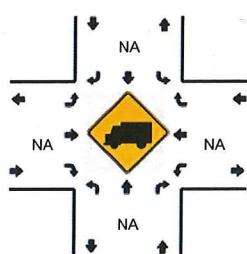
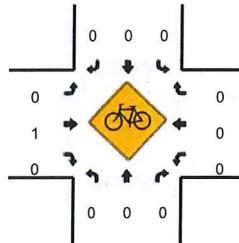
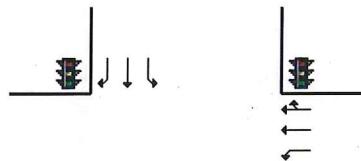
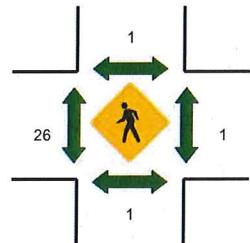
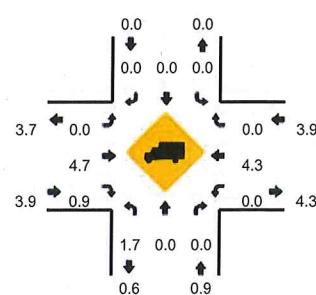
Method for determining peak hour: Total Entering Volume

LOCATION: Theater Access -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

QC JOB #: 13631614
DATE: Tue, Oct 27 2015



Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:40 PM -- 5:55 PM



5-Min Count Period	Theater Access (Northbound)				Theater Access (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals	
	Beginning At	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM		3	3	1	0	2	1	2	0	6	60	7	0	0	67	3	0	155	
4:05 PM		5	2	1	0	2	1	5	0	12	63	14	0	5	64	3	0	177	
4:10 PM		5	0	4	0	1	5	6	0	2	59	18	0	4	84	5	0	193	
4:15 PM		4	2	8	0	0	4	8	0	9	77	12	0	2	68	1	0	195	
4:20 PM		8	2	6	0	3	2	5	0	3	60	10	0	6	81	1	1	188	
4:25 PM		7	1	5	0	1	0	2	0	6	61	12	0	4	59	5	0	163	
4:30 PM		6	4	3	0	0	1	3	0	5	67	15	0	1	62	2	0	169	
4:35 PM		6	2	3	0	1	1	6	0	5	72	7	0	0	86	3	0	192	
4:40 PM		6	0	0	0	2	2	5	0	3	60	4	0	3	52	1	0	138	
4:45 PM		4	3	2	0	1	2	3	0	4	68	11	0	2	59	4	0	163	
4:50 PM		1	1	6	0	1	0	9	0	5	72	11	0	0	85	2	0	193	
4:55 PM		4	2	3	0	1	2	1	0	2	72	12	0	2	68	4	0	173	2099
5:00 PM		5	2	3	0	2	3	9	0	4	60	6	0	7	62	1	0	164	2108
5:05 PM		8	3	2	0	3	1	4	0	3	70	10	0	4	82	1	0	191	2122
5:10 PM		4	0	2	0	1	2	7	0	3	76	8	0	8	77	2	0	190	2119
5:15 PM		4	1	3	0	5	0	4	0	5	58	8	0	3	70	3	0	164	2088
5:20 PM		6	2	1	0	1	1	5	0	6	67	9	0	3	51	4	0	156	2056
5:25 PM		7	1	3	0	1	3	7	0	8	57	9	0	2	53	0	0	151	2044
5:30 PM		4	1	3	0	3	3	5	0	3	76	12	0	1	76	2	0	189	2064
5:35 PM		3	4	1	0	3	2	7	0	13	63	7	0	3	70	4	0	180	2052
5:40 PM		5	1	7	0	2	1	8	0	5	76	10	0	0	77	7	0	199	2113
5:45 PM		6	1	4	0	3	4	21	0	10	72	9	0	2	75	7	0	214	2164
5:50 PM		4	3	3	0	6	5	9	0	10	70	17	0	2	79	6	0	214	2185
5:55 PM		5	2	1	0	4	2	15	0	9	53	5	0	3	52	6	0	157	2169
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	60	20	56	0	44	40	152	0	100	872	144	0	16	924	80	0	2508		
Heavy Trucks	0	0	0	0	0	0	0	0	0	24	0	0	0	28	0	0	52		
Pedestrians	0	0	0	0	0	0	0	0	44	0	0	0	0	0	0	0	44		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Comments:

Report generated on 11/5/2015 2:31 PM

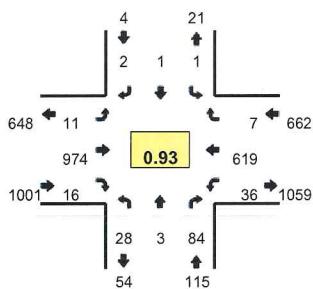
SOURCE: Quality Counts, LLC (<http://www.qualitycounts.net>) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

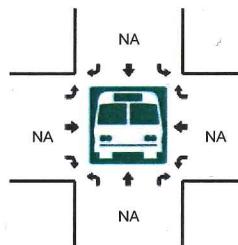
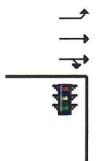
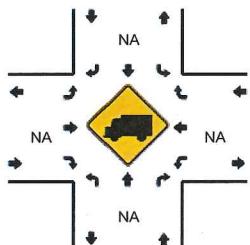
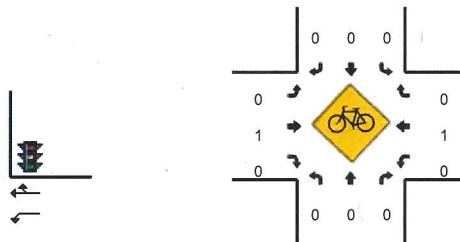
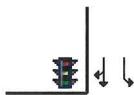
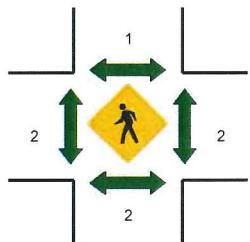
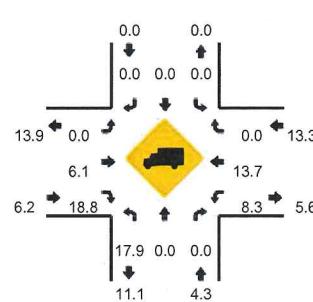
Method for determining peak hour: Total Entering Volume

LOCATION: SW Baler Way -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

QC JOB #: 13631611
DATE: Tue, Oct 27 2015



Peak-Hour: 7:10 AM -- 8:10 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



5-Min Count Period Beginning At	SW Baler Way (Northbound)				SW Baler Way (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	0	4	0	0	0	0	0	0	63	3	0	4	47	0	0	121		
7:05 AM	2	0	7	0	0	0	0	0	0	73	0	0	2	32	0	0	116		
7:10 AM	4	0	6	0	0	0	0	0	0	84	1	0	3	47	1	0	146		
7:15 AM	2	0	8	0	0	0	2	0	2	89	0	0	2	59	0	0	164		
7:20 AM	0	0	8	0	0	0	0	0	1	78	2	0	4	53	0	0	146		
7:25 AM	1	0	3	0	0	0	0	0	0	85	0	0	2	36	0	0	127		
7:30 AM	2	0	6	1	0	0	0	0	1	70	2	0	2	62	1	0	147		
7:35 AM	1	0	7	0	0	0	0	0	1	72	0	0	7	46	0	0	134		
7:40 AM	3	2	7	0	0	0	0	0	0	83	2	0	3	52	0	0	152		
7:45 AM	5	0	0	0	0	0	0	0	2	88	1	0	0	63	1	0	160		
7:50 AM	1	0	10	0	1	0	0	0	0	87	2	0	1	62	1	0	165		
7:55 AM	3	0	11	0	0	0	0	0	0	79	1	0	6	53	0	0	153	1731	
8:00 AM	3	0	6	0	0	0	0	0	1	65	4	0	3	45	2	0	129	1739	
8:05 AM	2	1	12	0	0	1	0	0	3	94	1	0	3	41	1	0	159	1782	
8:10 AM	2	0	7	0	0	0	2	0	0	85	2	0	2	44	1	0	145	1781	
8:15 AM	2	0	6	0	0	0	0	0	2	68	6	0	3	48	0	0	135	1752	
8:20 AM	0	0	5	0	0	1	1	0	0	57	3	0	7	53	2	0	129	1735	
8:25 AM	6	0	5	0	0	0	0	0	0	68	2	0	4	51	0	0	136	1744	
8:30 AM	0	2	6	0	2	0	0	0	0	49	1	0	4	35	0	0	99	1696	
8:35 AM	2	0	6	0	2	0	1	0	3	73	4	0	4	68	2	0	165	1727	
8:40 AM	1	0	1	0	1	0	0	0	2	67	3	0	7	57	0	0	139	1714	
8:45 AM	2	0	7	0	0	1	1	0	0	73	2	0	9	65	0	0	160	1714	
8:50 AM	3	0	2	0	0	0	0	0	1	52	1	0	1	50	0	0	110	1659	
8:55 AM	2	1	2	0	1	0	0	0	1	70	1	0	3	29	4	0	114	1620	
Peak 15-Min Flowrates		Northbound				Southbound				Eastbound				Westbound					
		Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles		36	0	84	0	4	0	0	0	8	1016	16	0	28	712	8	0	1912	
Heavy Trucks		4	0	0	0	0	0	0	0	0	48	4	0	0	92	0	0	148	
Pedestrians		4									4				4			12	
Bicycles		0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	
Railroad																			
Stopped Buses																			

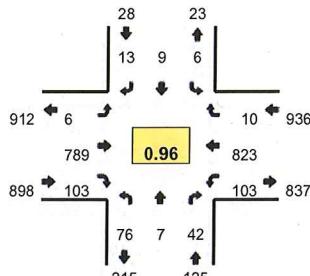
Comments:

Type of peak hour being reported: Intersection Peak

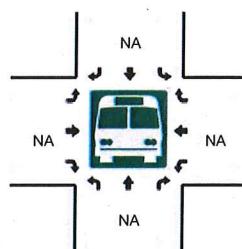
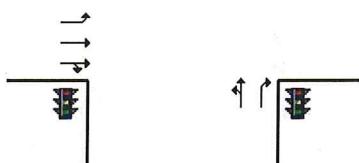
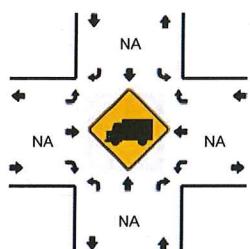
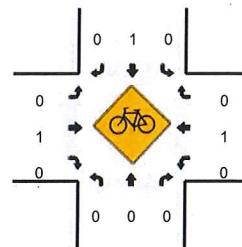
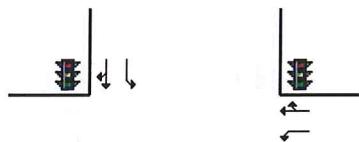
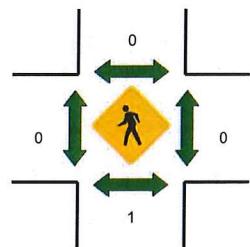
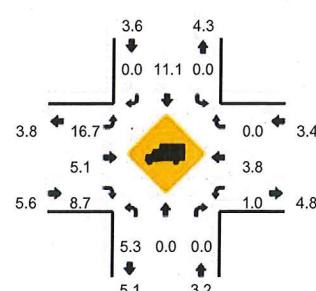
Method for determining peak hour: Total Entering Volume

LOCATION: SW Baler Way -- SW Tualatin-Sherwood Rd
CITY/STATE: Sherwood, OR

QC JOB #: 13631612
DATE: Tue, Oct 27 2015



Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



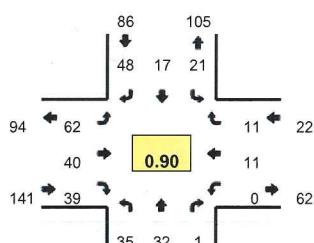
5-Min Count Period Beginning At	SW Baler Way (Northbound)				SW Baler Way (Southbound)				SW Tualatin-Sherwood Rd (Eastbound)				SW Tualatin-Sherwood Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	6	0	3	0	2	0	0	0	1	59	4	0	8	64	2	0	149	
4:05 PM	10	2	9	0	1	1	2	0	2	53	7	0	7	68	0	0	162	
4:10 PM	4	0	7	0	0	0	3	0	0	62	10	0	11	87	1	0	185	
4:15 PM	11	0	4	0	0	1	0	0	0	71	9	0	8	61	0	0	165	
4:20 PM	4	0	6	0	1	1	0	0	0	68	5	0	2	83	3	0	173	
4:25 PM	5	0	8	0	1	0	2	0	1	62	7	0	5	52	1	0	144	
4:30 PM	7	1	4	0	1	0	2	0	0	62	11	0	5	74	1	0	168	
4:35 PM	6	2	4	0	0	0	2	0	1	72	1	0	12	68	1	0	169	
4:40 PM	4	2	3	0	1	1	0	0	1	43	2	0	9	60	1	0	127	
4:45 PM	8	1	2	0	1	1	4	0	2	85	8	0	10	68	0	0	190	
4:50 PM	8	1	7	0	2	2	1	0	0	67	11	0	8	71	1	0	179	
4:55 PM	1	0	3	0	0	0	1	0	1	69	4	0	6	63	0	0	148	1959
5:00 PM	6	0	2	0	0	1	0	0	0	62	5	0	5	74	0	0	155	1965
5:05 PM	8	0	4	0	0	0	0	0	0	59	16	0	12	75	2	0	176	1979
5:10 PM	11	0	2	0	0	1	0	0	1	68	5	0	9	69	1	0	167	1961
5:15 PM	5	0	2	0	0	0	1	0	0	66	4	0	10	83	2	0	173	1969
5:20 PM	2	1	2	0	1	1	2	0	1	61	12	0	7	54	0	0	144	1940
5:25 PM	5	2	6	0	0	0	2	0	0	54	9	0	4	57	0	0	139	1935
5:30 PM	9	1	4	0	0	2	0	0	0	69	7	0	9	61	3	0	165	1932
5:35 PM	9	0	4	0	0	1	2	0	0	58	9	0	9	74	1	0	167	1930
5:40 PM	4	1	4	0	2	0	0	0	1	71	13	0	14	74	0	0	184	1987
5:45 PM	10	1	4	0	1	2	1	0	0	52	14	0	8	69	1	0	163	1960
5:50 PM	9	0	8	0	1	0	1	0	0	80	12	0	12	81	0	0	204	1985
5:55 PM	7	0	3	0	0	0	0	0	0	48	4	0	5	69	1	0	137	1974
Peak 15-Min Flowrates		Northbound				Southbound				Eastbound				Westbound				
		Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total
All Vehicles	68	8	48	0	12	12	24	0	12	884	92	0	96	808	4	0	2068	
Heavy Trucks	8	0	0	0	0	0	0	0	4	68	8	0	0	12	0	0	100	
Pedestrians	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Comments:																		

Type of peak hour being reported: Intersection Peak

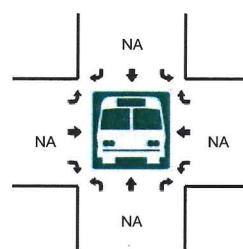
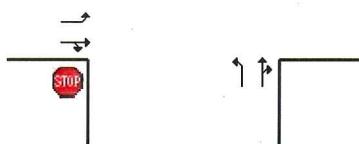
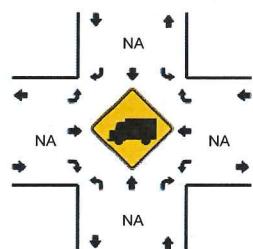
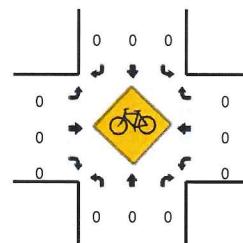
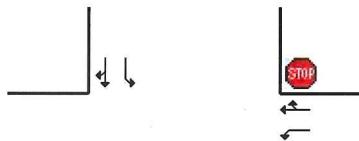
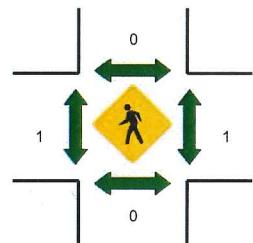
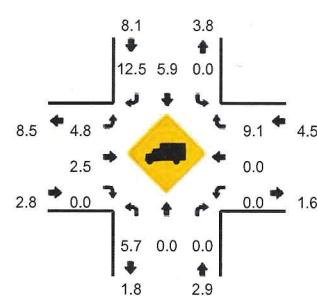
Method for determining peak hour: Total Entering Volume

LOCATION: SW Baler Way -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631609
DATE: Tue, Oct 27 2015



Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 7:55 AM -- 8:10 AM



5-Min Count Period Beginning At	SW Baler Way (Northbound)				SW Baler Way (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	0	0	0	2	4	0	3	3	2	0	0	2	0	0	18	
7:05 AM	6	4	0	0	0	0	2	0	7	0	3	0	0	0	0	0	22	
7:10 AM	6	3	0	0	1	1	2	0	5	1	0	0	0	0	0	0	19	
7:15 AM	4	5	0	0	0	0	2	0	5	3	0	0	0	2	0	0	21	
7:20 AM	3	1	0	0	2	0	3	0	7	4	1	0	1	1	0	0	23	
7:25 AM	4	3	0	0	0	0	2	0	3	2	2	0	0	0	1	0	17	
7:30 AM	1	2	0	0	0	2	3	0	4	1	4	0	0	1	0	0	18	
7:35 AM	3	4	0	0	0	0	7	0	5	0	1	0	0	1	0	0	21	
7:40 AM	5	3	0	0	0	2	3	0	8	3	6	0	0	0	1	0	31	
7:45 AM	8	4	0	0	0	1	0	0	1	4	5	0	0	1	0	0	24	
7:50 AM	3	2	0	0	0	1	1	0	7	3	4	0	0	0	3	0	24	
7:55 AM	5	4	0	0	0	2	6	0	6	3	3	0	0	0	0	0	29	267
8:00 AM	2	4	0	0	4	0	2	0	6	2	6	0	0	0	2	0	28	277
8:05 AM	2	2	0	0	0	3	2	0	9	5	5	0	0	2	1	0	31	286
8:10 AM	1	3	0	0	2	0	1	0	7	4	1	0	0	2	0	0	21	288
8:15 AM	5	3	0	0	6	2	2	0	4	3	2	0	0	0	0	0	27	294
8:20 AM	4	1	0	0	1	3	7	0	5	6	5	0	0	0	0	0	32	303
8:25 AM	4	4	0	0	0	1	5	0	3	1	2	0	0	0	2	0	22	308
8:30 AM	2	4	0	0	1	1	3	0	5	2	4	0	0	2	0	0	24	314
8:35 AM	2	3	0	0	4	1	3	0	5	3	1	0	0	1	0	0	23	316
8:40 AM	1	0	0	0	1	1	8	0	1	4	4	0	0	3	1	0	24	309
8:45 AM	4	2	1	0	2	2	8	0	4	4	2	0	0	1	2	0	32	317
8:50 AM	2	3	0	0	1	0	1	0	3	3	1	0	0	2	0	0	16	309
8:55 AM	3	1	0	0	1	0	2	0	3	3	0	0	0	0	2	0	15	295
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	36	40	0	0	16	20	40	0	84	40	56	0	0	8	12	0	352	
Heavy Trucks	0	0	0	0	0	0	8	0	0	0	0	0	0	0	4	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

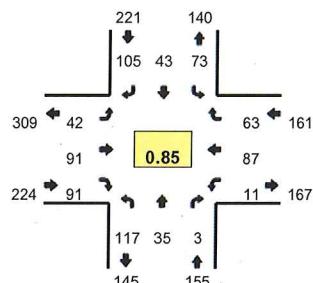
Comments:

Type of peak hour being reported: Intersection Peak

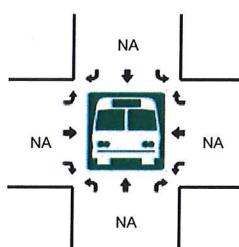
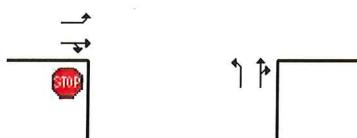
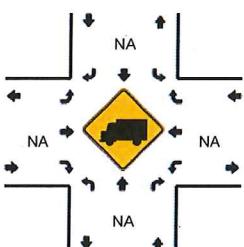
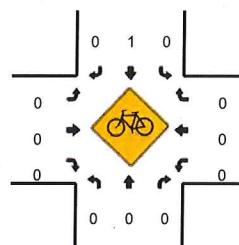
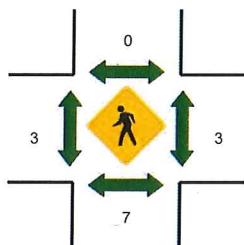
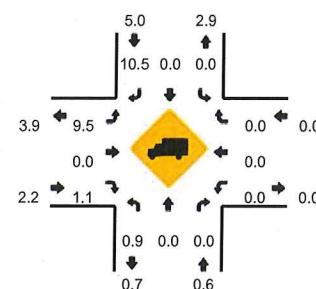
Method for determining peak hour: Total Entering Volume

LOCATION: SW Baler Way -- SW Langer Dr
CITY/STATE: Sherwood, OR

QC JOB #: 13631610
DATE: Tue, Oct 27 2015



Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:40 PM -- 5:55 PM



5-Min Count Period Beginning At	SW Baler Way (Northbound)				SW Baler Way (Southbound)				SW Langer Dr (Eastbound)				SW Langer Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	1	1	0	2	3	8	0	3	2	6	0	1	4	9	0	49	
4:05 PM	9	7	1	0	5	6	5	0	4	8	8	0	2	4	6	0	65	
4:10 PM	11	3	2	0	4	7	9	0	5	5	2	0	1	13	4	0	66	
4:15 PM	7	6	0	0	7	2	9	0	4	11	6	0	2	9	6	0	69	
4:20 PM	6	4	0	0	4	2	3	0	3	8	8	0	2	4	3	0	47	
4:25 PM	9	3	1	0	6	1	4	0	3	3	3	0	0	8	5	0	46	
4:30 PM	11	2	0	0	7	2	7	0	5	6	8	0	1	4	7	0	60	
4:35 PM	9	4	1	0	4	0	10	0	4	8	10	0	1	4	3	0	58	
4:40 PM	5	2	2	0	1	2	6	0	4	6	6	0	1	7	3	0	45	
4:45 PM	9	2	1	0	6	2	10	0	3	4	4	0	2	10	8	0	61	
4:50 PM	9	3	0	0	8	2	11	0	7	8	10	0	0	6	3	0	67	
4:55 PM	10	3	0	0	4	2	3	0	2	7	9	0	1	9	3	0	53	686
5:00 PM	12	1	1	0	4	2	5	0	4	5	2	0	1	8	4	0	49	686
5:05 PM	6	4	1	0	11	4	11	0	3	9	13	0	0	6	4	0	72	693
5:10 PM	14	5	0	0	3	3	10	0	2	11	5	0	4	7	11	0	75	702
5:15 PM	13	0	0	0	2	3	8	0	2	4	8	0	0	1	2	0	43	676
5:20 PM	5	4	0	0	6	4	8	0	3	6	8	0	2	10	1	0	57	686
5:25 PM	6	0	0	0	7	3	6	0	5	6	7	0	0	5	7	0	52	692
5:30 PM	7	5	1	0	3	6	9	0	3	5	8	0	0	9	7	0	63	695
5:35 PM	14	4	0	0	5	6	6	0	2	9	7	0	0	7	8	0	68	705
5:40 PM	10	2	0	0	7	4	17	0	3	8	6	0	0	10	1	0	68	728
5:45 PM	12	4	0	0	12	6	6	0	6	10	6	0	1	8	7	0	78	745
5:50 PM	8	4	0	0	11	2	13	0	6	10	9	0	1	7	6	0	77	755
5:55 PM	10	2	0	0	2	0	6	0	3	8	12	0	2	9	5	0	59	761
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Total	
All Vehicles	120	40	0	0	120	48	144	0	60	112	84	0	8	100	56	0	892	
Heavy Trucks	0	0	0	0	0	0	12	0	4	0	0	0	0	0	0	0	16	
Pedestrians	4	0	0	0	0	0	0	0	8	0	0	0	0	0	4	0	16	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	Comments:																	

APPENDIX C: YEAR 2015 EXISTING TRAFFIC CONDITIONS WORKSHEETS

Existing Traffic Conditions
1: SW Sherwood Blvd & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑		↑	↑↑		↑	↑	
Volume (vph)	93	39	30	88	15	90	35	339	117	111	234	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.0		6.8	6.0		5.8	5.4		6.7	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.93		1.00	0.87		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1728		1687	1546		1703	3267		1719	1860	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1736	1728		1687	1546		1703	3267		1719	1860	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	108	45	35	102	17	105	41	394	136	129	272	3
RTOR Reduction (vph)	0	32	0	0	92	0	0	38	0	0	1	0
Lane Group Flow (vph)	108	48	0	102	30	0	41	492	0	129	274	0
Confl. Peds. (#/hr)				2	2		1		9	9		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	3%	0%	7%	7%	7%	6%	6%	3%	5%	2%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	5.4	4.8		7.6	7.9		2.1	20.9		6.0	25.9	
Effective Green, g (s)	5.4	4.8		7.6	7.9		2.1	20.9		6.0	25.9	
Actuated g/C Ratio	0.08	0.07		0.12	0.12		0.03	0.33		0.09	0.40	
Clearance Time (s)	5.9	6.0		6.8	6.0		5.8	5.4		6.7	5.2	
Vehicle Extension (s)	2.7	1.6		2.4	1.6		2.9	2.1		2.6	2.1	
Lane Grp Cap (vph)	146	129		199	190		55	1063		160	750	
v/s Ratio Prot	c0.06	c0.03		0.06	c0.02		0.02	c0.15		c0.08	c0.15	
v/s Ratio Perm												
v/c Ratio	0.74	0.37		0.51	0.16		0.75	0.46		0.81	0.37	
Uniform Delay, d1	28.7	28.3		26.6	25.2		30.8	17.2		28.5	13.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.2	0.7		1.5	0.1		41.5	0.1		24.3	0.1	
Delay (s)	45.9	28.9		28.1	25.3		72.3	17.3		52.8	13.5	
Level of Service	D	C		C	C		E	B		D	B	
Approach Delay (s)		38.7			26.6			21.3			26.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			64.2				Sum of lost time (s)			24.9		
Intersection Capacity Utilization			46.9%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

Existing Traffic Conditions

2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday AM Peak Hour

11/23/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	89	24	145	69	12	95
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	96	26	156	74	13	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	321	193		230		
vC1, stage 1 conf vol	193					
vC2, stage 2 conf vol	128					
vCu, unblocked vol	321	193		230		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	88	97		99		
cM capacity (veh/h)	777	854		1350		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	96	26	230	13	102	
Volume Left	96	0	0	13	0	
Volume Right	0	26	74	0	0	
cSH	777	854	1700	1350	1700	
Volume to Capacity	0.12	0.03	0.14	0.01	0.06	
Queue Length 95th (ft)	10	2	0	1	0	
Control Delay (s)	10.3	9.3	0.0	7.7	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	10.1		0.0	0.9		
Approach LOS	B					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		23.4%		ICU Level of Service		A
Analysis Period (min)		15				

Existing Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↓			↑	↓			
Volume (veh/h)	36	111	4	29	86	14	2	15	31	29	10	6
Sign Control	Free				Free			Stop			Stop	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	42	129	5	34	100	16	2	17	36	34	12	7
Pedestrians					2			3				
Lane Width (ft)						12.0			12.0			
Walking Speed (ft/s)						4.0			4.0			
Percent Blockage						0			0			
Right turn flare (veh)										2		
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	1198											
pX, platoon unblocked												
vC, conflicting volume	116			137			391	402	136	417	396	108
vC1, stage 1 conf vol							218	218		176	176	
vC2, stage 2 conf vol							173	184		242	220	
vCu, unblocked vol	116			137			391	402	136	417	396	108
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.6		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	97			98			100	97	96	95	98	99
cM capacity (veh/h)	1466			1456			668	609	914	621	620	951
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	42	134	34	116	56	52						
Volume Left	42	0	34	0	2	34						
Volume Right	0	5	0	16	36	7						
cSH	1466	1700	1456	1700	1415	651						
Volume to Capacity	0.03	0.08	0.02	0.07	0.04	0.08						
Queue Length 95th (ft)	2	0	2	0	3	7						
Control Delay (s)	7.5	0.0	7.5	0.0	9.8	11.0						
Lane LOS	A		A		A	B						
Approach Delay (s)	1.8		1.7		9.8	11.0						
Approach LOS					A	B						
Intersection Summary												
Average Delay	3.9											
Intersection Capacity Utilization	24.9%			ICU Level of Service			A					
Analysis Period (min)	15											

Existing Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday AM Peak Hour

11/23/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1		1	1	
Volume (veh/h)	5	165	1	3	122	3	2	0	4	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	7	220	1	4	163	4	3	0	5	1	0	7
Pedestrians								4				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	167			225			415	413	225	411	411	165
vC1, stage 1 conf vol							238	238		173	173	
vC2, stage 2 conf vol							177	175		239	239	
vCu, unblocked vol	167			225			415	413	225	411	411	165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	99
cM capacity (veh/h)	1424			1351			687	643	817	690	643	885
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	7	221	4	167	8	8						
Volume Left	7	0	4	0	3	1						
Volume Right	0	1	0	4	5	7						
cSH	1424	1700	1351	1700	769	845						
Volume to Capacity	0.00	0.13	0.00	0.10	0.01	0.01						
Queue Length 95th (ft)	0	0	0	0	1	1						
Control Delay (s)	7.5	0.0	7.7	0.0	9.7	9.3						
Lane LOS	A		A		A	A						
Approach Delay (s)	0.2		0.2		9.7	9.3						
Approach LOS					A	A						
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		19.3%			ICU Level of Service				A			
Analysis Period (min)			15									

Existing Traffic Conditions
5: Theater Access & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑↑	↑↑		↑↑	↑↑		↑↑	↑↑	↑↑
Volume (vph)	15	971	59	29	612	5	54	4	30	2	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.0	5.5		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3327		1492	3166		1597	1647		1805	1900	1592
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3327		1492	3166		1597	1647		1805	1900	1592
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	1033	63	31	651	5	57	4	32	2	1	4
RTOR Reduction (vph)	0	3	0	0	0	0	0	29	0	0	0	4
Lane Group Flow (vph)	16	1093	0	31	656	0	57	7	0	2	1	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	7%	17%	21%	14%	0%	13%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												8
Actuated Green, G (s)	0.5	38.3		1.9	39.2		3.7	6.0		0.5	2.8	6.0
Effective Green, g (s)	0.5	38.3		1.9	39.2		3.7	6.0		0.5	2.8	6.0
Actuated g/C Ratio	0.01	0.60		0.03	0.61		0.06	0.09		0.01	0.04	0.09
Clearance Time (s)	4.5	5.5		4.0	5.5		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.5	3.5		1.5	3.5		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	27	1984		44	1933		92	153		14	82	148
v/s Ratio Prot	0.00	c0.33		c0.02	0.21		c0.04	c0.00		0.00	0.00	
v/s Ratio Perm												0.00
v/c Ratio	0.59	0.55		0.70	0.34		0.62	0.05		0.14	0.01	0.00
Uniform Delay, d1	31.7	7.8		30.9	6.1		29.6	26.5		31.6	29.4	26.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.0	0.4		34.2	0.1		8.4	0.0		1.7	0.0	0.0
Delay (s)	52.8	8.1		65.0	6.3		38.0	26.5		33.3	29.4	26.4
Level of Service	D	A		E	A		D	C		C	C	C
Approach Delay (s)		8.8			8.9			33.6			28.8	
Approach LOS		A			A			C			C	

Intersection Summary

HCM 2000 Control Delay 10.1 HCM 2000 Level of Service B

HCM 2000 Volume to Capacity ratio 0.52

Actuated Cycle Length (s) 64.2

Sum of lost time (s)

18.0

Intersection Capacity Utilization 46.3%

ICU Level of Service A

Analysis Period (min) 15

c Critical Lane Group

Existing Traffic Conditions

6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	↑↓		1	↑			↑		1	1	4
Volume (vph)	11	975	17	35	616	7	26	3	85	1	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.99	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3389		1703	1666			1548	1593	1802	1642	
Flt Permitted	0.34	1.00		0.23	1.00			0.74	1.00	0.74	1.00	
Satd. Flow (perm)	652	3389		410	1666			1202	1593	1398	1642	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	12	1048	18	38	662	8	28	3	91	1	1	4
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	81	0	4	0
Lane Group Flow (vph)	12	1065	0	38	670	0	0	31	10	1	1	0
Confl. Peds. (#/hr)	1		2	2		1	2		2	2		2
Confl. Bikes (#/hr)				1		1						
Heavy Vehicles (%)	0%	6%	18%	6%	14%	0%	19%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2			1	6			8			4
Permitted Phases	2				6		8		8	4		
Actuated Green, G (s)	35.3	34.7		37.3	35.7			5.9	5.9	5.9	5.9	
Effective Green, g (s)	35.3	34.7		37.3	35.7			5.9	5.9	5.9	5.9	
Actuated g/C Ratio	0.63	0.62		0.66	0.64			0.10	0.10	0.10	0.10	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	4.5		1.5	4.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	421	2092		308	1058			126	167	146	172	
v/s Ratio Prot	0.00	0.31		c0.00	c0.40						0.00	
v/s Ratio Perm	0.02			0.08			c0.03	0.01	0.00			
v/c Ratio	0.03	0.51		0.12	0.63			0.25	0.06	0.01	0.01	
Uniform Delay, d1	4.2	6.0		3.5	6.3			23.1	22.6	22.5	22.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	1.6			0.4	0.1	0.0	0.0	
Delay (s)	4.2	6.3		3.6	7.8			23.5	22.7	22.5	22.5	
Level of Service	A	A		A	A			C	C	C	C	
Approach Delay (s)		6.3			7.6			22.9			22.5	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			7.9		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			56.2		Sum of lost time (s)				14.0			
Intersection Capacity Utilization			50.9%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

Existing Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	68	34	38	1	10	8	41	38	0	8	13	32
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	83	41	46	1	12	10	50	46	0	10	16	39
Pedestrians					2			1				
Lane Width (ft)						12.0		12.0				
Walking Speed (ft/s)						4.0		4.0				
Percent Blockage						0		0				
Right turn flare (veh)												
Median type							TWLTL					
Median storage veh							2					
Upstream signal (ft)												299
pX, platoon unblocked												
vC, conflicting volume	217	203	36	252	223	48	55					48
vC1, stage 1 conf vol	55	55		148	148							
vC2, stage 2 conf vol	162	148		103	74							
vCu, unblocked vol	217	203	36	252	223	48	55					48
tC, single (s)	7.2	6.6	6.2	8.1	6.5	6.3	4.2					4.1
tC, 2 stage (s)	6.2	5.6		7.1	5.5							
tF (s)	3.6	4.1	3.3	4.4	4.0	3.4	2.3					2.2
p0 queue free %	89	94	96	100	98	99	97					99
cM capacity (veh/h)	746	706	1041	552	709	991	1519					1569
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	83	88	1	22	50	46	10	55				
Volume Left	83	0	1	0	50	0	10	0				
Volume Right	0	46	0	10	0	0	0	39				
cSH	746	850	552	812	1519	1700	1569	1700				
Volume to Capacity	0.11	0.10	0.00	0.03	0.03	0.03	0.01	0.03				
Queue Length 95th (ft)	9	9	0	2	3	0	0	0				
Control Delay (s)	10.4	9.7	11.5	9.6	7.5	0.0	7.3	0.0				
Lane LOS	B	A	B	A	A		A					
Approach Delay (s)	10.1		9.7		3.9		1.1					
Approach LOS	B		A									
Intersection Summary												
Average Delay			6.7									
Intersection Capacity Utilization			26.4%			ICU Level of Service				A		
Analysis Period (min)			15									

Existing Traffic Conditions

1: SW Sherwood Blvd & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙	↖ ↗ ↘ ↙ ↖ ↙ ↘ ↗ ↖ ↙ ↘ ↗ ↙
Volume (vph)	94	28	53	138	42	259	36	355	147	104	272	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	6.0		6.8	6.0		5.8	5.4		6.7	5.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.87		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1679		1719	1640		1805	3330		1752	1868	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1679		1719	1640		1805	3330		1752	1868	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	29	56	145	44	273	38	374	155	109	286	13
RTOR Reduction (vph)	0	48	0	0	225	0	0	58	0	0	2	0
Lane Group Flow (vph)	99	37	0	145	92	0	38	471	0	109	297	0
Confl. Peds. (#/hr)				6	6				8	8		
Confl. Bikes (#/hr)									1		1	
Heavy Vehicles (%)	1%	0%	0%	5%	0%	1%	0%	2%	4%	3%	1%	0%
Turn Type	Prot	NA										
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	5.1	8.3		6.2	10.3		2.0	14.0		5.3	18.4	
Effective Green, g (s)	5.1	8.3		6.2	10.3		2.0	14.0		5.3	18.4	
Actuated g/C Ratio	0.09	0.14		0.11	0.18		0.03	0.24		0.09	0.31	
Clearance Time (s)	5.9	6.0		6.8	6.0		5.8	5.4		6.7	5.2	
Vehicle Extension (s)	2.7	1.6		2.4	1.6		2.9	2.1		2.6	2.1	
Lane Grp Cap (vph)	155	237		181	287		61	794		158	585	
v/s Ratio Prot	0.06	0.02		c0.08	c0.06		0.02	0.14		c0.06	c0.16	
v/s Ratio Perm												
v/c Ratio	0.64	0.16		0.80	0.32		0.62	0.59		0.69	0.51	
Uniform Delay, d1	25.9	22.1		25.6	21.1		28.0	19.8		25.9	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.8	0.1		21.2	0.2		17.7	0.8		11.1	0.3	
Delay (s)	33.7	22.2		46.9	21.4		45.7	20.7		37.0	16.8	
Level of Service	C	C		D	C		D	C		D	B	
Approach Delay (s)		28.4			29.4			22.3			22.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		25.0										
HCM 2000 Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		58.7										
Intersection Capacity Utilization		63.9%										
Analysis Period (min)		15										
c Critical Lane Group												

Existing Traffic Conditions
2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday PM Peak Hour
11/23/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑
Volume (veh/h)	141	17	144	84	13	301
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	150	18	153	89	14	320
Pedestrians	3					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	549	204			246	
vC1, stage 1 conf vol	201					
vC2, stage 2 conf vol	348					
vCu, unblocked vol	549	204			246	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	77	98			99	
cM capacity (veh/h)	650	838			1283	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	150	18	243	14	320	
Volume Left	150	0	0	14	0	
Volume Right	0	18	89	0	0	
cSH	650	838	1700	1283	1700	
Volume to Capacity	0.23	0.02	0.14	0.01	0.19	
Queue Length 95th (ft)	22	2	0	1	0	
Control Delay (s)	12.2	9.4	0.0	7.8	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	11.9		0.0	0.3		
Approach LOS	B					
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		30.8%		ICU Level of Service		A
Analysis Period (min)		15				

Existing Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	13	136	15	110	249	35	26	43	68	65	31	8
Sign Control		Free				Free		Stop			Stop	
Grade		0%				0%		0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	14	146	16	118	268	38	28	46	73	70	33	9
Pedestrians						6		2				
Lane Width (ft)						12.0		12.0				
Walking Speed (ft/s)						4.0		4.0				
Percent Blockage						1		0				
Right turn flare (veh)								2				
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)		1198										
pX, platoon unblocked												
vC, conflicting volume	305			164			705	726	162	763	715	287
vC1, stage 1 conf vol							184	184		523	523	
vC2, stage 2 conf vol							521	542		240	192	
vCu, unblocked vol	305			164			705	726	162	763	715	287
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			93	90	92	83	93	99
cM capacity (veh/h)	1222			1418			426	443	882	415	450	757
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	162	118	305	147	112						
Volume Left	14	0	118	0	28	70						
Volume Right	0	16	0	38	73	9						
cSH	1222	1700	1418	1700	867	441						
Volume to Capacity	0.01	0.10	0.08	0.18	0.17	0.25						
Queue Length 95th (ft)	1	0	7	0	15	25						
Control Delay (s)	8.0	0.0	7.8	0.0	12.2	15.9						
Lane LOS	A		A		B	C						
Approach Delay (s)	0.6		2.2		12.2	15.9						
Approach LOS					B	C						
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization		40.9%			ICU Level of Service				A			
Analysis Period (min)		15										

Existing Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	20	248	1	5	346	12	16	0	10	8	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	270	1	5	376	13	17	0	11	9	0	35
Pedestrians					2			8			6	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	395			279			743	728	280	725	722	389
vC1, stage 1 conf vol							322	322		399	399	
vC2, stage 2 conf vol							422	406		326	322	
vCu, unblocked vol	395			279			743	728	280	725	722	389
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	98	100	95
cM capacity (veh/h)	1169			1287			491	502	757	524	512	661
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	22	271	5	389	28	43						
Volume Left	22	0	5	0	17	9						
Volume Right	0	1	0	13	11	35						
cSH	1169	1700	1287	1700	568	628						
Volume to Capacity	0.02	0.16	0.00	0.23	0.05	0.07						
Queue Length 95th (ft)	1	0	0	0	4	6						
Control Delay (s)	8.1	0.0	7.8	0.0	11.7	11.2						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.6		0.1		11.7	11.2						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization		30.1%			ICU Level of Service					A		
Analysis Period (min)		15										

Existing Traffic Conditions

5: Theater Access & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑↑	↑↑		↑↑	↑↑		↑↑	↑↑	↑↑
Volume (vph)	72	817	117	37	849	41	60	21	35	31	27	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.0	5.5		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	3380		1805	3451		1770	1708		1805	1900	1566
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	3380		1805	3451		1770	1708		1805	1900	1566
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	83	939	134	43	976	47	69	24	40	36	31	100
RTOR Reduction (vph)	0	8	0	0	2	0	0	36	0	0	0	89
Lane Group Flow (vph)	83	1065	0	43	1021	0	69	28	0	36	31	11
Confl. Peds. (#/hr)	1		1	1		1	26		1	1		26
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	5%	1%	0%	4%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												8
Actuated Green, G (s)	4.4	36.0		3.0	34.1		5.1	7.4		2.9	5.2	7.4
Effective Green, g (s)	4.4	36.0		3.0	34.1		5.1	7.4		2.9	5.2	7.4
Actuated g/C Ratio	0.07	0.54		0.04	0.51		0.08	0.11		0.04	0.08	0.11
Clearance Time (s)	4.5	5.5		4.0	5.5		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	1.5	3.5		1.5	3.5		1.5	1.5		1.5	1.5	1.5
Lane Grp Cap (vph)	230	1821		81	1761		135	189		78	147	173
v/s Ratio Prot	0.02	c0.32		c0.02	0.30		c0.04	c0.02		0.02	0.02	
v/s Ratio Perm												0.01
v/c Ratio	0.36	0.58		0.53	0.58		0.51	0.15		0.46	0.21	0.06
Uniform Delay, d1	29.9	10.4		31.2	11.4		29.7	26.9		31.2	28.9	26.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.5		3.3	0.5		1.4	0.1		1.6	0.3	0.1
Delay (s)	30.2	10.9		34.5	11.9		31.0	27.0		32.8	29.1	26.7
Level of Service	C	B		C	B		C	C		C	C	C
Approach Delay (s)		12.3			12.8			29.1			28.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		14.4										
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		66.8										
Intersection Capacity Utilization		57.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Existing Traffic Conditions

6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	↑↓		1	↑↓			1	↑↓	1	↑↓	
Volume (vph)	4	769	110	105	834	10	83	7	48	5	8	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	1.00			1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3389		1787	1824			1737	1615	1805	1633	
Flt Permitted	0.21	1.00		0.24	1.00			0.73	1.00	0.69	1.00	
Satd. Flow (perm)	398	3389		459	1824			1323	1615	1315	1633	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	854	122	117	927	11	92	8	53	6	9	11
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	47	0	10	0
Lane Group Flow (vph)	4	968	0	117	938	0	0	100	6	6	10	0
Confl. Bikes (#/hr)			1			1					1	
Heavy Vehicles (%)	0%	4%	6%	1%	4%	0%	5%	0%	0%	0%	12%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	47.0	46.2		53.8	49.6			8.0	8.0	8.0	8.0	
Effective Green, g (s)	47.0	46.2		53.8	49.6			8.0	8.0	8.0	8.0	
Actuated g/C Ratio	0.65	0.64		0.74	0.69			0.11	0.11	0.11	0.11	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	4.5		1.5	4.5			1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	273	2162		418	1249			146	178	145	180	
v/s Ratio Prot	0.00	0.29		c0.02	c0.51						0.01	
v/s Ratio Perm	0.01			0.19				c0.08	0.00	0.00		
v/c Ratio	0.01	0.45		0.28	0.75			0.68	0.03	0.04	0.06	
Uniform Delay, d1	6.2	6.6		3.2	7.4			31.0	28.7	28.8	28.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	2.9			10.1	0.0	0.0	0.0	
Delay (s)	6.2	6.9		3.3	10.3			41.1	28.8	28.8	28.9	
Level of Service	A	A		A	B			D	C	C	C	
Approach Delay (s)		6.9			9.5			36.8			28.9	
Approach LOS		A			A			D			C	
Intersection Summary												
HCM 2000 Control Delay		10.5										B
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		72.4										14.0
Intersection Capacity Utilization		72.0%										C
Analysis Period (min)		15										
c Critical Lane Group												

Existing Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1		1	1	
Volume (veh/h)	41	90	88	10	87	61	117	36	3	75	45	103
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	48	106	104	12	102	72	138	42	4	88	53	121
Pedestrians		2			3			7				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type							TWLTL					None
Median storage veh								2				
Upstream signal (ft)												299
pX, platoon unblocked												
vC, conflicting volume	733	616	123	715	675	47	176					49
vC1, stage 1 conf vol	292	292		322	322							
vC2, stage 2 conf vol	441	324		393	353							
vCu, unblocked vol	733	616	123	715	675	47	176					49
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)	6.2	5.5		6.1	5.5							
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	84	77	89	96	76	93	90					94
cM capacity (veh/h)	303	465	924	294	429	1025	1410					1567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	48	209	12	174	138	46	88	174				
Volume Left	48	0	12	0	138	0	88	0				
Volume Right	0	104	0	72	0	4	0	121				
cSH	303	616	294	564	1410	1700	1567	1700				
Volume to Capacity	0.16	0.34	0.04	0.31	0.10	0.03	0.06	0.10				
Queue Length 95th (ft)	14	38	3	33	8	0	4	0				
Control Delay (s)	19.1	13.8	17.7	14.2	7.8	0.0	7.4	0.0				
Lane LOS	C	B	C	B	A		A					
Approach Delay (s)	14.8		14.4		5.9		2.5					
Approach LOS	B		B									
Intersection Summary												
Average Delay			9.3									
Intersection Capacity Utilization		43.4%		ICU Level of Service					A			
Analysis Period (min)		15										

APPENDIX D: ODOT CRASH DATA

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Langer Drive & SW Sherwood Boulevard
 January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION	INTER-	SECTION	OFF-	ROAD			
														YEAR: 2013	REAR-END	YEAR: 2012	TURNING MOVEMENTS	YEAR: 2011	ANGLE	FINAL TOTAL
YEAR: 2013	0	2	0	2	0	5	0	2	0	2	0	2	0	2	0	0	0	0	0	0
TOTAL	0	2	0	2	0	5	0	2	0	2	0	2	0	2	0	0	0	0	0	0
YEAR: 2012	0	0	1	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0
TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0
YEAR: 2011	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0
TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0
FINAL TOTAL	0	3	1	4	0	6	0	4	0	4	0	4	0	4	0	0	0	0	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file.
Please be aware of this change when comparing pre-2011 crash statistics.

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Langer Drive & SW Sherwood Boulevard

January 1, 2011 through December 31, 2013

SER# INVEST	D P E A U C O E L G H R D C S L K	DATE TIME	CLASS DIST FROM SECOND STREET	CITY STREET FIRST STREET	RD CHAR DIRECT LOCN	INT-TYP (MEDIAN) LEGS (LANES)	INT-REL OFF-RD RNDBT DRWY	CRASH TYP COLL TYP	MOVE FROM TO	PRTC TYPE	INJ TYPE	A S LICNS X RES	PED LOC	ACTN EVENT	CAUSE
02217 N N N	05/02/2013	16	SW LANGER DR N SHERWOOD BLVD	INTER NE	RD DIRECT LOCN	3-LEG N	TRF SIGNAL N DRY N DAY	N CLR S-1STOP REAR INJ	01 NONE PRVTE PSNGR CAR	STRAIGHT NE SW	18 M OR-Y OR<25	026	000	000	07 00 07
NONE	Thu 5P					0									
04399 N N N	08/22/2012	16	SW LANGER DR N SHERWOOD BLVD	INTER SE	RD DIRECT LOCN	3-LEG N	TRF SIGNAL N DRY N DAY	N CLR ANGL-STP TURN PDO	01 NONE PRVTE PSNGR CAR	TURN-L NE SE	44 F OR-Y OR>25	000	000	000	00 00 00
CITY	Wed 6P					0									
04031 N N N N	07/25/2013	16	SW LANGER DR N SHERWOOD BLVD	INTER SE	RD DIRECT LOCN	3-LEG N	TRF SIGNAL N DRY N DAY	N CLR S-1STOP REAR INJ	01 NONE PRVTE PSNGR CAR	STOP SE NW	33 F OR-Y OR<25	000	000	000	00 00 00
CITY	Thu 6P					0									
05256 N N N	09/26/2011	16	SW LANGER DR N SHERWOOD BLVD	INTER CN	RD DIRECT LOCN	3-LEG N	TRF SIGNAL N DRY Y DAY	N CLR ANGL-OTH ANGL INJ	01 NONE PRVTE PSNGR CAR	STRAIGHT NW SE	06 M OR-Y OR<25	000	000	000	00 00 00
NONE	Mon 5P					0									

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Langer Dr between SW Sherwood Blvd and 99W (excludes ending intersections)

January 1, 2011 through December 31, 2013

YEAR:	COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION RELATED	INTER-SECTION OFF-ROAD
TOTAL														
FINAL TOTAL														

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

99W Pacific Highway West (091) & SW Langer Drive
January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION	OFF-ROAD RELATED
YEAR: 2013														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2013 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2012														
ANGLE	0	0	2	2	0	0	0	0	2	2	0	2	0	0
2012 TOTAL	0	0	2	2	0	0	0	0	2	2	0	2	0	0
YEAR: 2011														
ANGLE	0	1	1	2	0	1	0	1	1	1	2	0	2	0
2011 TOTAL	0	1	1	2	0	1	0	1	1	1	2	0	2	0
FINAL TOTAL	0	2	3	5	0	2	0	2	3	5	0	5	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file.
Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

99W Pacific Highway West (091) & SW Langer Drive
 January 1, 2011 through December 31, 2013

S	D	P	R	S	W	RD#	FC	COMPNT	CONN #	RD CHAR	INT-TYP	TRAIL QTY	MOVE	A	S	CAUSE	
SER#	E A U C O	D A T E	COUNTY	CITY	URBAN AREA	MILE TYP	FIRST STREET	MILEPNT	SECOND STREET	DIRECT	(#LANES)	CRASH TYP	FROM	RTC	INJ	LIONS	PED
INVEST	D C S L I K	T I M E				LEGGS	LOCNTN			TRAF-	COLL TYP	TO	P#	TYPE	SVRTY	E X	RES
06571	N N N	11/21/2011	WASHINGTON	1 19	1	SW LANGER DR	INTER	3-LEG	N	N RAIN ANGL-OTH	01	NONE	0	STREIGHT			
NO REPT	Mon	SHERWOOD	6 0	LEG TO 99W FR SHWD	01	CN	CN	STOP SIGN	N WET ANGL	PRVTE	E	W	01	DRVR	INJ	39 F OR-Y	000
	11A	PORTLAND	15.07		0	N DAY	N DAY		N DAY	PSNGR CAR			000	000			000
00528	N N N N	01/29/2011	WASHINGTON	1 19	1	SW LANGER DR	INTER	3-LEG	N	N CLR ANGL-OTH	01	NONE	0	STREIGHT			
CITY	Sat	SHERWOOD	6 0	LEG TO 99W FR SHWD	02	CN	CN	STOP SIGN	N DRY ANGL	PRVTE	E	W	01	DRVR	INJ	39 F OR-Y	028
	2P	PORTLAND	15.07		0	Y DAY	Y DAY		Y DAY	PSNGR CAR			000	000			000
00981	N N N	02/26/2012	WASHINGTON	1 19	1	SW LANGER DR	INTER	3-LEG	N	N RAIN ANGL-OTH	01	NONE	0	STREIGHT			
NONE	Sun	SHERWOOD	6 0	LEG TO 99W FR SHWD	02	CN	CN	STOP SIGN	N WET ANGL	PRVTE	S	N	01	DRVR	INJ	40 M OR-Y	025
	2P	PORTLAND	15.07		0	Y DAY	Y DAY		Y DAY	PSNGR CAR			000	000			000
02015	N N N	04/20/2012	WASHINGTON	1 14	1	SW LANGER DR	INTER	3-LEG	N	N CLR ANGL-OTH	01	NONE	0	STREIGHT			
NONE	Fri	SHERWOOD	6 0	LEG TO 99W FR SHWD	03	CN	CN	STOP SIGN	N WET ANGL	PRVTE	N	S	01	DRVR	INJ	41 F OR-Y UNK	000
	4P	PORTLAND	15.07		0	Y DAY	Y DAY		Y DAY	PSNGR CAR			000	000			000
													02	None	0	STREIGHT	
													01	DRVR	INJ	39 F OR-Y OR<25	000

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING
99W Pacific Highway West (991) & SW Lander Drive

CITY OF SHERWOOD, WASHINGTON COUNTY

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

SW Pacific Highway West (J91) & SW Langer Drive

January 1, 2011 through December 31, 2013

卷之三

SPECH USE

EEI, OEE-RD WTHR CRASH TYP TBLR CTY MOVE

BRUNNEN, GÖTTSCHE LOWE, HÄGGSTRÖM, KARLSSON, LINDSTRÖM, MÅRTENS, NORDH, RÖNNINGEN, SÖDERQVIST, TÖRNQVIST, WILHELMSSON

RNDBI SURF COLL TIP CDR OWNER FROM TO BY

BRWY LIGHT SVRTY V# VEH TYPE TO PH T#

THE JOURNAL OF CLIMATE

N CLR ANGL-OTH 01 NONE 0 STRGHT

SIGN N DRY D.N.G.R.

PSNGR CAR 81 BH

SER#	P	R	S	W	DATE	CLASS	CITY STREET	RD CHBR	INT-TYP (MEDIAN)	OFF- RD	WTHR	CRASH TYP	SPCL USE
INVEST	E	A	U	C	DAY	DIST	FIRST STREET	DIRECT	RNDBT	COLL TIP	TRLR QTY	MOVE	
	I	L	G	H	DAY	FROM	SECOND STREET	LOCNTN	LEGS	SURFTY	OWNER	PRTC	
	C	S	L	K	TIME				(#LANES)	LIGHT	TYPE	INJ	
05312	N	N	N	N	09/20/2013	17	SW LANGER DR.	INNER	3-LEG	N	CLR	A	
CITY	Fri					0	LEG TO 92W FR SHWD	CN	STOP	SIGN	ANGL	LICNS	
	12p					0.2		N	DRY	INJ	V#	PED	
									DAY		VEH TYPE	LOC	
											TYPE	RES	
											SVRTY	ACTN	
											E	EVENT	
											X	CAUSE	

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

PAGE: 1

SW Langer Dr East of 99W

January 1, 2011 through December 31, 2013

YEAR:	COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION RELATED ROAD	
														INTER-SECTION
TOTAL														
FINAL TOTAL														

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SW Tualatin-Sherwood Road between 99W and SW Baler Way

January 1, 2011 through December 31, 2013

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION	OFF-RELATED ROAD
YEAR: 2013														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	0	0	0
REAR-END	0	0	2	2	0	0	1	2	0	2	0	0	1	0
2013 TOTAL	0	1	2	3	0	1	1	2	1	3	0	0	1	0
YEAR: 2012														
NON-COLLISION	0	0	1	1	0	0	1	0	1	0	1	0	0	0
REAR-END	0	2	5	7	0	2	0	4	3	7	0	0	4	0
SIDESWIPE - OVERTAKING	0	1	1	2	0	2	0	1	1	1	1	0	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	0	1	0	0	1
2012 TOTAL	0	4	7	11	0	5	1	6	5	8	3	0	4	1
YEAR: 2011														
REAR-END	0	1	2	3	0	2	0	2	1	1	2	0	2	0
2011 TOTAL	0	1	2	3	0	2	0	2	1	1	2	0	2	0
FINAL TOTAL	0	6	11	17	0	8	2	10	7	12	5	0	7	1

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

CITY OF SHERWOOD, WASHINGTON COUNTY

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING
SW Tualatin-Sherwood Road between 99W and SW Baler Way

January 1, 2000 through December 31, 2014

S P R S W	D E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	CLASS DIST FROM SECOND STREET	CITY STREET FIRST STREET	RD CHAR DIRECT LOCNTN	INT-TP (MEDIAN) OFF-IRD TRAF- LEGS (#LANES)	INT-TP RNBST COLL TYP DRVRY LIGHT SVRTY	CRASH TYP SURF COLL TYP DRVRY LIGHT SVRTY	SPEC USE TRLR QTY OWNER VH# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E LICNS X RES	PED LOC	ACTN	EVENT	CAUSE
62399 N N N N 07/22/2012 16 575 SW TUALATIN-SHERWOOD CITY Sun 4A	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCNTN	INT-TP (MEDIAN) OFF-IRD TRAF- LEGS (#LANES)	INT-TP RNBST COLL TYP DRVRY LIGHT SVRTY	CRASH TYP SURF COLL TYP DRVRY LIGHT SVRTY	SPEC USE TRLR QTY OWNER VH# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E LICNS X RES	PED LOC	ACTN	EVENT	CAUSE	
01995 N N N N 04/19/2012 16 70 SW TUALATIN-SHERWOOD SW PACIFIC HY 99W NO RPT Thu 5P	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	ALLEY SE	N CLD BIKE TURN	N CLD BIKE TURN	N CLD BIKE TURN	N CLD BIKE TURN	STRAIGHT 01 BIKE INJB	56 M	08	000	000 110	000	110	02		
00424 N N N N 01/23/2012 16 100 SW TUALATIN-SHERWOOD SW PACIFIC HY 99W CITY Non 5P	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	STRAIGHT SE	N CLD BIKE TURN	N CLD BIKE TURN	N CLD BIKE TURN	N CLD BIKE TURN	STRAIGHT 01 BIKE INJB	56 M	08	000	000 110	000	110	02		
07562 N N N N 09/12/2012 16 100 SW TUALATIN-SHERWOOD SW PACIFIC HY 99W CITY Wed 4P	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	STRAIGHT SE	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	STRAIGHT 01 BIKE INJB	56 M	08	000	000 110	000	110	02		
02695 N N N N 05/24/2012 16 125 SW TUALATIN-SHERWOOD SW PACIFIC HY 99W CITY Thu 2P	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	STRAIGHT SE	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	STRAIGHT 01 BIKE INJB	56 M	08	000	000 110	000	110	02		
04085 N N N N 07/26/2013 16 391 SW TUALATIN-SHERWOOD SW PACIFIC HY 99W CITY Fri 3P	P R S W E A U C O DATE E L G H R DAY INVEST D C S I L K TIME	STRAIGHT SE	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	N CLR SIGNAL N DRY DAY	STRAIGHT 01 BIKE INJB	56 M	08	000	000 110	000	110	02		

<u>COLLISION TYPE</u>	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION	OFF-RELATED ROAD
<u>YEAR: 2013</u>														
TURNING MOVEMENTS	0	1	2	3	0	3	0	2	1	2	1	3	0	0
2013 TOTAL	0	1	2	3	0	3	0	2	1	2	1	3	0	0
YEAR: 2012	0	0	2	2	0	0	0	2	0	2	0	2	0	0
REAR-END	0	3	1	4	0	4	0	3	1	4	0	4	0	0
TURNING MOVEMENTS	0	3	3	6	0	4	0	5	1	6	0	6	0	0
2012 TOTAL	0	3	3	6	0	4	0	5	1	6	0	6	0	0
YEAR: 2011	0	0	1	1	0	0	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2011 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	4	6	10	0	7	0	7	3	9	1	10	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Tualatin-Sherwood Road & SW Baler Way
January 1, 2000 through December 31, 2014

S E R I N C Y C I T Y	D R A U L C S K	P W O R H R K	S E A U L C D C	R C O R S L K	DATE DAY TIME	CLASS CITY STREET FIRST STREET SECOND STREET	DIST FROM TO	RD CHAR DIRECT LOCNTN	INT-TYP (MEDIAN) LEGS #LANES)	INT-REL OFF-RD RNBTF CONTNL	WTHR SURF COLL TYP DRAWY	CRASH TYP COLL TYP SVRTY	SPCL USE MOVE OWNER PSNGR CAR	TRTC FROM TO	INJ TYPE	G E LICNS X RES	ACTN LOC	CAUSE	
02052	N N N N	04/22/2012	16	SW BAER WAY	INTER	3-LEG	N	CLR	S-1STOP	01	NONE	0	STRAIGHT		026	000	000	07	
				SW TUALATIN-SHERWOOD	W	0	TRF SIGNAL	N	DRY DAY	PDO	PRVTE PSNGR CAR	W	E	01	DRVR	None	32 F OR-Y OR<25	000	000
05435	N N N N	09/28/2012	16	SW BAER WAY	INTER	3-LEG	N	CLR	S-1STOP	01	NONE	0	STRAIGHT		000	000	000	00	
				SW TUALATIN-SHERWOOD	W	0	TRF SIGNAL	N	DRY DAY	PDO	PRVTE PSNGR CAR	W	E	01	DRVR	None	46 F OR-Y OR<25	000	00
06209	N N N N	10/15/2011	16	SW BAER WAY	INTER	3-LEG	N	CLR	ANGL-OTH	01	NONE	0	STRAIGHT		000	000	000	00	
				SW TUALATIN-SHERWOOD	CN	0	TRF SIGNAL	N	WET DAY	PDO	PRVTE PSNGR CAR	E	W	01	DRVR	None	18 F OR-Y OR<25	000	00
03180	N N N N	06/09/2012	16	SW BAER WAY	INTER	3-LEG	N	CLR	ANGL-OTH	01	NONE	0	STRAIGHT		028	028	000	02	
NO RPT				SW TUALATIN-SHERWOOD	CN	0	TRF SIGNAL	N	DRY DAY	PDO	PRVTE PSNGR CAR	N	W	01	DRVR	None	52 F OR-Y OR<25	000	02
02418	N N N N	05/12/2012	16	SW BAER WAY	INTER	3-LEG	N	CLR	O-1TURN	01	NONE	0	STRAIGHT		000	000	000	00	
				SW TUALATIN-SHERWOOD	CN	0	TRF SIGNAL	N	DRY DAY	INJ	PRVTE PSNGR CAR	E	W	01	DRVR	None	40 M OR-Y OR<25	000	00
02205	N N N N	04/30/2012	16	SW BAER WAY	INTER	CROSS	N	CLR	O-1TURN	01	NONE	0	STRAIGHT		000	000	000	00	
				SW TUALATIN-SHERWOOD	CN	0	TRF SIGNAL	N	DRY DAY	INJ	PRVTE PSNGR CAR	W	E	01	DRVR	None	60 M OR-Y OR<25	000	02

PAGE: 1

CITY OF SHERWOOD, WASHINGTON COUNTY

SW Tualatin-Sherwood Road & SW Baler Way

January 1, 2000 through December 31, 2014

INVEST	D C S L K	TIME	SER#	E A U C O	DATE	CITY STREET	CLASS	RD CHAR	INT-REL (MEDIAN) TRAFFIC LEGS	OFF-RD RNDBT SURF COLL TYP	CRASH TYP	MOVE FROM V# VEH TYPE	PRTC P# TYPE	INJ SVRTY	A S G E LICNS X RES	PED LOC	ACTN EVENT	CAUSE	
S	D	P	R	S	W	CITY STREET	CLASS	RD CHAR	INT-REL (MEDIAN) TRAFFIC LEGS	OFF-RD RNDBT SURF COLL TYP	CRASH TYP	MOVE FROM V# VEH TYPE	PRTC P# TYPE	INJ SVRTY	A S G E LICNS X RES	PED LOC	ACTN EVENT	CAUSE	
FROM	SECOND STREET																		
05464	N N Y N N	Sat 10/13/2012	16	SW BALER WAY	SW TUALATIN-SHERWOOD	INTER CN	3-LEG N L-GRN-SIG	N RAIN	S-OTHER TURN INJ	01 NONE PRIVATE PSNGR CAR	TURN-L W N	01 DRVR PRIVATE PSNGR CAR	INJC	55 F OR-Y	004,028	000	000	000	
						Q3	0	N WET DAY	Y	PRIVATE PSNGR CAR	TURN-L W N	01 DRVR PRIVATE PSNGR CAR	INJC	56 F OR-Y	043,042	000	019	07	
05281	N N N N N	Thu 09/19/2013	16	SW BALER WAY	SW TUALATIN-SHERWOOD	INTER CN	3-LEG N TRF SIGNAL	N DRY TURN INJ	0-1TURN N INJ	01 NONE PRIVATE PSNGR CAR	TURN-L W E	01 DRVR PRIVATE PSNGR CAR	INJC	44 F OR-Y	000	000	019	00	
						Q3	0	N DAY	N	PRIVATE PSNGR CAR	TURN-L W E	02 PSNG PRIVATE PSNGR CAR	INJC	39 M OR<25	000	000	000	00	
06492	N Y N	Fri 11/08/2013	16	SW BALER WAY	SW TUALATIN-SHERWOOD	INTER CN	3-LEG N TRF SIGNAL	N CLD TURN PDO	0-1TURN N PDO	02 NONE PRIVATE PSNGR CAR	TURN-L E S	01 DRVR PRIVATE PSNGR CAR	INJC	26 M OR-Y	028	000	000	000	
						Q3	0	N WET DAY	N	PRIVATE PSNGR CAR	TURN-L W E	02 PSNG PRIVATE PSNGR CAR	INJC	24 F OR<25	000	000	000	00	
06733	N N N N N	Wed 11/20/2013	16	SW BALER WAY	SW TUALATIN-SHERWOOD	INTER CN	3-LEG N FLASHBCN-A	N CLD DRY TURN PDO	0-1TURN N PDO	02 NONE PRIVATE PSNGR CAR	TURN-L E S	01 DRVR PRIVATE PSNGR CAR	INJC	66 M OR-Y	020	000	000	04	
						Q3	0	N DAY	N	PRIVATE PSNGR CAR	TURN-L W E	02 PSNG PRIVATE PSNGR CAR	INJC	42 M OR-Y	028	000	000	02	

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION	OFF- RELATED ROAD
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2012														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	0	1	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	0	1	0
2012 TOTAL	0	0	2	2	0	0	0	0	2	0	2	0	2	0
FINAL TOTAL	0	0	3	3	0	0	0	2	1	3	0	3	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARTIAL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
015	GO A/STOP	PROCEEDED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	FREV COL	FREVERSE COLLISION
023	STAILED	VEHICLE STALLED
024	DRV'R DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLIGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKFRRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X/N SIGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAFF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAFF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAFF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAFF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY
088	OTHER	OTHER ACTION

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED)
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DOVE LEFT OF CENTER ON TWO-WAY ROAD, STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RD.
16	FATIGUE	DRIVER DROWSY/PATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VTSBL	NOT MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHING
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESSV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
6	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BKKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	EX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1TURN	FROM OPPOSITE DIRECTION - ONE TURN, ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC	SHORT CODE	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	U-ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LIGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED STREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDESTRIAN
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
04.2	F/SILO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
04.3	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
04.4	STRDL IN	STRADDLING OR DRIVING ON WRONG LANES
04.5	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
04.6	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
04.7	BASCRLUE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
04.8	OPEN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
04.9	IMPEDING TRAFFIC	IMPEDING TRAFFIC
05.0	SPEED	DRIVING IN EXCESS OF POSTED SPEED
05.1	RECKLESS	RECKLESS DRIVING (PER PAR)
05.2	CARELESS	CARELESS DRIVING (PER PAR)
05.3	RACING	SPEED RACING (PER PAR)
05.4	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
05.5	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
05.6	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
05.7	BTWN INT	CROSSING BETWEEN INTERSECTIONS
05.9	W/TRAFF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
06.0	A/TRAFF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
06.1	W/TRAFF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
06.2	A/TRAFF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
06.3	PLAYINRD	PLAYING IN STREET OR ROAD
06.4	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
06.5	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
07.0	LAY ON RD	STANDING OR LYING IN ROADWAY
07.1	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
07.3	ELUDING	ELUDING / ATTEMPT TO ELUDE
07.9	F NEG CURV	FAILED TO NEGOTIATE A CURVE
08.0	FAIL LN	FAILED TO MAINTAIN LANE
08.1	OFF RD	RAN OFF ROAD
08.2	NO CLEAR	DRIVER MISJUDGED CLEARANCE
08.3	OVERSTEER	OVER-CORRECTING
08.4	NOT USED	CODE NOT IN USE
08.5	OVRLOAD	OVERTLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
09.7	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHTRK	HITCHHIKER (SOLICITING A RIDE)
008	PSGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC)
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHED	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELLOP	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOAD LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LIVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HOSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATTENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB - (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LASTING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRD	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINERATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP, OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SIGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SIGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FAILEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/OBJECT IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	TRGL PST	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRRREGULARITY (PER PAR)
074	OVERHD OBU	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	H2 WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH/EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	AERUF EDGE
099	CELL WNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	OTH RR GATE	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

HIGHWAY COMPONENT TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	Possible INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DTYMD	EARTH, GRASS OR PAVED MEDIAN

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
2	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRAIGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIRE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN OCCUPANT OF A PARKED MOTOR VEHICLE
8	PRKD	UNKNOWN TYPE OF NON-MOTORIST
9	UNK	

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNOWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
11	AT INTERSECTION - IN BIKE LANE
12	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
13	OTHER, NOT IN ROADWAY
14	UNKNOWN LOCATION

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OCFR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG
025	X-BUCK WRN	X-BUCK WRN
026	WN W/ GATE	CROSSBUCK AND ADVANCE WARNING
027	OVHD SGNL	FLASHING LIGHTS WITH DROP-ARM GATES
028	SP RR STOP	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
040	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALI. TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

APPENDIX E: YEAR 2016 BACKGROUND TRAFFIC CONDITIONS WORKSHEETS

Background Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday AM Peak Hour
11/23/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	131	282	42	543	109	82	103	123
v/c Ratio	0.52	0.30	0.22	0.43	0.46	0.29	0.46	0.38
Control Delay	37.5	18.0	33.5	20.9	35.9	19.9	36.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	18.0	33.5	20.9	35.9	19.9	36.5	11.9
Queue Length 50th (ft)	43	56	14	82	36	15	34	5
Queue Length 95th (ft)	#132	192	50	165	103	53	98	45
Internal Link Dist (ft)		443		298		225		260
Turn Bay Length (ft)	100		175		100		200	
Base Capacity (vph)	355	1003	352	1716	359	577	349	594
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.28	0.12	0.32	0.30	0.14	0.30	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Background Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (vph)	113	240	3	36	348	119	94	40	30	89	15	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.96		1.00	0.94		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1860		1703	3268		1736	1731		1687	1546	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1860		1703	3268		1736	1731		1687	1546	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	131	279	3	42	405	138	109	47	35	103	17	106
RTOR Reduction (vph)	0	1	0	0	37	0	0	32	0	0	95	0
Lane Group Flow (vph)	131	281	0	42	506	0	109	50	0	103	28	0
Confl. Peds. (#/hr)	9		1	1		9			2	2		
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	2%	0%	6%	6%	3%	4%	3%	0%	7%	7%	7%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.1	26.2		2.1	21.1		5.5	6.0		5.2	6.6	
Effective Green, g (s)	6.1	26.2		2.1	21.1		5.5	6.0		5.2	6.6	
Actuated g/C Ratio	0.10	0.41		0.03	0.33		0.09	0.09		0.08	0.10	
Clearance Time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Vehicle Extension (s)	2.6	2.1		2.9	2.1		2.7	1.6		2.4	1.6	
Lane Grp Cap (vph)	165	769		56	1089		150	164		138	161	
v/s Ratio Prot	c0.08	c0.15		0.02	c0.15		c0.06	c0.03		0.06	0.02	
v/s Ratio Perm												
v/c Ratio	0.79	0.37		0.75	0.46		0.73	0.31		0.75	0.17	
Uniform Delay, d1	28.0	12.8		30.3	16.6		28.2	26.7		28.4	25.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.0	0.1		42.3	0.1		15.5	0.4		18.4	0.2	
Delay (s)	50.0	12.9		72.7	16.8		43.7	27.1		46.8	26.1	
Level of Service	D	B		E	B		D	C		D	C	
Approach Delay (s)		24.7			20.8			36.5			35.5	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay				26.4			HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio				0.54								
Actuated Cycle Length (s)				63.3			Sum of lost time (s)			24.9		
Intersection Capacity Utilization				47.3%			ICU Level of Service			A		
Analysis Period (min)				15								
c Critical Lane Group												

Background Traffic Conditions
2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday AM Peak Hour

11/23/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↗ ↘ ↗					
Volume (veh/h)	90	24	147	70	12	96
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	97	26	158	75	13	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh)			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	325	196		233		
vC1, stage 1 conf vol	196					
vC2, stage 2 conf vol	129					
vCu, unblocked vol	325	196		233		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	88	97		99		
cM capacity (veh/h)	774	851		1346		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	97	26	233	13	103	
Volume Left	97	0	0	13	0	
Volume Right	0	26	75	0	0	
cSH	774	851	1700	1346	1700	
Volume to Capacity	0.12	0.03	0.14	0.01	0.06	
Queue Length 95th (ft)	11	2	0	1	0	
Control Delay (s)	10.3	9.4	0.0	7.7	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	10.1		0.0	0.9		
Approach LOS	B					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		23.7%		ICU Level of Service		A
Analysis Period (min)		15				

Background Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1	1	1	1	1
Volume (veh/h)	37	113	4	29	87	42	2	15	31	29	10	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	43	131	5	34	101	49	2	17	36	34	12	7
Pedestrians					2			3				
Lane Width (ft)						12.0			12.0			
Walking Speed (ft/s)						4.0			4.0			
Percent Blockage						0			0			
Right turn flare (veh)										2		
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)		1198										
pX, platoon unblocked												
vC, conflicting volume	150			139			397	440	139	439	418	126
vC1, stage 1 conf vol							223	223		193	193	
vC2, stage 2 conf vol							174	217		246	225	
vCu, unblocked vol	150			139			397	440	139	439	418	126
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.6		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	97			98			100	97	96	94	98	99
cM capacity (veh/h)	1425			1453			663	590	911	612	611	930
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	43	136	34	150	56	52						
Volume Left	43	0	34	0	2	34						
Volume Right	0	5	0	49	36	7						
cSH	1425	1700	1453	1700	1411	641						
Volume to Capacity	0.03	0.08	0.02	0.09	0.04	0.08						
Queue Length 95th (ft)	2	0	2	0	3	7						
Control Delay (s)	7.6	0.0	7.5	0.0	9.9	11.1						
Lane LOS	A		A		A	B						
Approach Delay (s)	1.8		1.4		9.9	11.1						
Approach LOS					A	B						
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization		29.6%			ICU Level of Service					A		
Analysis Period (min)		15										

Background Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday AM Peak Hour

11/23/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	5	167	1	3	151	3	2	0	4	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	7	223	1	4	201	4	3	0	5	1	0	7
Pedestrians												4
Lane Width (ft)												12.0
Walking Speed (ft/s)												4.0
Percent Blockage												0
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	205			228			457	454	227	453	453	203
vC1, stage 1 conf vol							241	241		211	211	
vC2, stage 2 conf vol							216	213		241	241	
vCu, unblocked vol	205			228			457	454	227	453	453	203
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	99
cM capacity (veh/h)	1378			1348			665	626	814	669	627	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	224	4	205	8	8
Volume Left	7	0	4	0	3	1
Volume Right	0	1	0	4	5	7
cSH	1378	1700	1348	1700	758	808
Volume to Capacity	0.00	0.13	0.00	0.12	0.01	0.01
Queue Length 95th (ft)	0	0	0	0	1	1
Control Delay (s)	7.6	0.0	7.7	0.0	9.8	9.5
Lane LOS	A		A		A	A
Approach Delay (s)	0.2		0.1		9.8	9.5
Approach LOS					A	A

Intersection Summary

Average Delay	0.5	
Intersection Capacity Utilization	19.4%	ICU Level of Service
Analysis Period (min)	15	A

Background Traffic Conditions
5: Theater Access & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1008	60	0	652	14	0	0	35	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1072	64	0	694	15	0	0	37	0	0	4
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)					585							
pX, platoon unblocked	0.95						0.95	0.95		0.95	0.95	0.95
vC, conflicting volume	709			1136			1458	1813	568	1274	1837	357
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	581			1136			1373	1747	568	1178	1773	210
tC, single (s)	4.1			4.5			7.8	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	92	100	100	99
cM capacity (veh/h)	950			512			89	82	471	129	80	758
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	715	421	462	246	37	4						
Volume Left	0	0	0	0	0	0						
Volume Right	0	64	0	15	37	4						
cSH	1700	1700	1700	1700	471	758						
Volume to Capacity	0.42	0.25	0.27	0.14	0.08	0.01						
Queue Length 95th (ft)	0	0	0	0	6	0						
Control Delay (s)	0.0	0.0	0.0	0.0	13.3	9.8						
Lane LOS					B	A						
Approach Delay (s)	0.0		0.0		13.3	9.8						
Approach LOS					B	A						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization		39.8%			ICU Level of Service				A			
Analysis Period (min)		15										

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	1089	70	652	58	95	3	6
v/c Ratio	0.05	0.42	0.17	0.26	0.49	0.48	0.02	0.06
Control Delay	2.3	6.0	2.9	4.5	64.7	19.5	46.7	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	6.0	2.9	4.5	64.7	19.5	46.7	39.0
Queue Length 50th (ft)	2	123	5	63	44	2	2	1
Queue Length 95th (ft)	12	241	21	126	81	55	11	16
Internal Link Dist (ft)		505		1107		219		248
Turn Bay Length (ft)	200		325			200		
Base Capacity (vph)	723	2621	504	2507	121	431	157	355
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.42	0.14	0.26	0.48	0.22	0.02	0.02

Intersection Summary

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	9	21	996	17	65	599	7	54	3	86	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		1.7	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1793	3389		1703	3165		1514	1599		1799	1692	
Flt Permitted	0.39	1.00		0.23	1.00		0.66	1.00		0.91	1.00	
Satd. Flow (perm)	742	3389		404	3165		1045	1599		1722	1692	
Peak-hour factor, PHF	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	10	23	1071	18	70	644	8	58	3	92	3	2
RTOR Reduction (vph)	0	0	1	0	0	0	0	0	84	0	0	4
Lane Group Flow (vph)	0	33	1088	0	70	652	0	58	11	0	3	2
Confl. Peds. (#/hr)		1		2	2		1	2		2	2	
Confl. Bikes (#/hr)				1			1					
Heavy Vehicles (%)	2%	0%	6%	18%	6%	14%	0%	19%	0%	0%	0%	0%
Turn Type	custom	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA
Protected Phases		5	2			1	6		3	8		7
Permitted Phases		5	2			6			8			4
Actuated Green, G (s)	88.3	85.3		90.5	86.4		12.5	7.6		3.0	2.1	
Effective Green, g (s)	92.5	87.0		94.7	88.1		12.5	9.9		7.6	4.4	
Actuated g/C Ratio	0.77	0.72		0.79	0.73		0.10	0.08		0.06	0.04	
Clearance Time (s)	6.1	5.7		6.1	5.7		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	1.0	2.3		1.0	3.0		3.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	616	2457		385	2323		133	131		111	62	
v/s Ratio Prot	0.00	c0.32		c0.01	0.21		c0.02	0.01		0.00	0.00	
v/s Ratio Perm	0.04			0.13			c0.02			0.00		
v/c Ratio	0.05	0.44		0.18	0.28		0.44	0.08		0.03	0.03	
Uniform Delay, d1	3.2	6.7		3.5	5.3		50.1	50.8		52.7	55.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1		0.1	0.3		2.3	0.1		0.0	0.1	
Delay (s)	3.2	6.8		3.6	5.6		52.4	50.9		52.8	55.8	
Level of Service	A	A		A	A		D	D		D	E	
Approach Delay (s)		6.7			5.4			51.5			54.8	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay	9.9				HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)			16.0				
Intersection Capacity Utilization	52.2%				ICU Level of Service			A				
Analysis Period (min)	15											
c Critical Lane Group												

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour
11/23/2015

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Fr	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Background Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday AM Peak Hour

11/23/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1	0	1	1	1
Volume (veh/h)	96	35	39	1	10	8	42	39	0	8	13	63
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	117	43	48	1	12	10	51	48	0	10	16	77
Pedestrians					2			1				
Lane Width (ft)						12.0		12.0				
Walking Speed (ft/s)						4.0		4.0				
Percent Blockage						0		0				
Right turn flare (veh)												
Median type							TWLTL					None
Median storage veh)							2					
Upstream signal (ft)												299
pX, platoon unblocked												
vC, conflicting volume	240	226	55	257	264	50	93					50
vC1, stage 1 conf vol	74	74		152	152							
vC2, stage 2 conf vol	166	152		105	112							
vCu, unblocked vol	240	226	55	257	264	50	93					50
tC, single (s)	7.2	6.6	6.2	8.1	6.5	6.3	4.2					4.1
tC, 2 stage (s)	6.2	5.6		7.1	5.5							
tF (s)	3.6	4.1	3.3	4.4	4.0	3.4	2.3					2.2
p0 queue free %	84	94	95	100	98	99	97					99
cM capacity (veh/h)	737	697	1016	546	688	990	1471					1567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	117	90	1	22	51	48	10	93				
Volume Left	117	0	1	0	51	0	10	0				
Volume Right	0	48	0	10	0	0	0	77				
cSH	737	836	546	796	1471	1700	1567	1700				
Volume to Capacity	0.16	0.11	0.00	0.03	0.03	0.03	0.01	0.05				
Queue Length 95th (ft)	14	9	0	2	3	0	0	0				
Control Delay (s)	10.8	9.8	11.6	9.7	7.5	0.0	7.3	0.0				
Lane LOS	B	A	B	A	A		A					
Approach Delay (s)	10.4		9.8		3.9		0.7					
Approach LOS	B		A									
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			27.9%			ICU Level of Service				A		
Analysis Period (min)			15									

Background Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday PM Peak Hour

11/23/2015



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	310	39	543	100	86	147	322
v/c Ratio	0.45	0.49	0.18	0.70	0.40	0.29	0.54	0.62
Control Delay	34.9	20.9	32.7	25.0	34.1	15.3	37.9	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	20.9	32.7	25.0	34.1	15.3	37.9	11.7
Queue Length 50th (ft)	37	66	13	79	33	10	48	14
Queue Length 95th (ft)	109	222	49	170	99	49	#164	90
Internal Link Dist (ft)		443		298		225		260
Turn Bay Length (ft)	100		175		100		200	
Base Capacity (vph)	388	1000	400	1768	396	610	381	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn.	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.31	0.10	0.31	0.25	0.14	0.39	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Background Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2		1	1	2	1	2		1	2	
Volume (vph)	106	282	12	37	367	149	95	28	54	140	43	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1868		1805	3332		1787	1678		1719	1641	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1868		1805	3332		1787	1678		1719	1641	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	297	13	39	386	157	100	29	57	147	45	277
RTOR Reduction (vph)	0	2	0	0	55	0	0	49	0	0	229	0
Lane Group Flow (vph)	112	308	0	39	488	0	100	37	0	147	93	0
Confl. Peds. (#/hr)	8				8			6	6			
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	1%	0%	0%	2%	4%	1%	0%	0%	5%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	5.4	18.8		2.0	14.3		5.2	8.4		6.2	10.3	
Effective Green, g (s)	5.4	18.8		2.0	14.3		5.2	8.4		6.2	10.3	
Actuated g/C Ratio	0.09	0.32		0.03	0.24		0.09	0.14		0.10	0.17	
Clearance Time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Vehicle Extension (s)	2.6	2.1		2.9	2.1		2.7	1.6		2.4	1.6	
Lane Grp Cap (vph)	159	593		60	804		156	238		180	285	
v/s Ratio Prot	c0.06	c0.16		0.02	0.15		0.06	0.02		c0.09	c0.06	
v/s Ratio Perm												
v/c Ratio	0.70	0.52		0.65	0.61		0.64	0.16		0.82	0.33	
Uniform Delay, d1	26.1	16.5		28.3	19.9		26.1	22.3		25.9	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.5	0.4		22.0	0.9		8.1	0.1		23.4	0.2	
Delay (s)	38.6	16.9		50.3	20.9		34.2	22.4		49.3	21.7	
Level of Service	D	B		D	C		C	C		D	C	
Approach Delay (s)		22.7			22.9			28.7			30.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.6		HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			59.2		Sum of lost time (s)			24.9				
Intersection Capacity Utilization			64.8%		ICU Level of Service			C				
Analysis Period (min)			15									
c Critical Lane Group												

Background Traffic Conditions
2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday PM Peak Hour
11/23/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑ ↗	↑ ↗	↗ ↑	↗ ↘	↖ ↗	↓ ↑
Volume (veh/h)	143	17	146	85	13	306
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	152	18	155	90	14	326
Pedestrians	3					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	557	207		249		
vC1, stage 1 conf vol	204					
vC2, stage 2 conf vol	353					
vCu, unblocked vol	557	207		249		
tC, single (s)	6.4	6.2		4.2		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.3		
p0 queue free %	76	98		99		
cM capacity (veh/h)	646	835		1279		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	152	18	246	14	326	
Volume Left	152	0	0	14	0	
Volume Right	0	18	90	0	0	
cSH	646	835	1700	1279	1700	
Volume to Capacity	0.24	0.02	0.14	0.01	0.19	
Queue Length 95th (ft)	23	2	0	1	0	
Control Delay (s)	12.3	9.4	0.0	7.8	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	12.0		0.0	0.3		
Approach LOS	B					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		31.2%		ICU Level of Service		A
Analysis Period (min)		15				

Background Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	13	138	15	112	253	66	26	44	69	66	31	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	14	148	16	120	272	71	28	47	74	71	33	9
Pedestrians					6			2				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					1			0				
Right turn flare (veh)								2				
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)		1198										
pX, platoon unblocked												
vC, conflicting volume	343			167			716	770	164	791	743	308
vC1, stage 1 conf vol							186	186		548	548	
vC2, stage 2 conf vol							530	584		243	194	
vCu, unblocked vol	343			167			716	770	164	791	743	308
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			91			93	89	92	82	92	99
cM capacity (veh/h)	1183			1415			419	424	879	403	439	737
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	165	120	343	149	113						
Volume Left	14	0	120	0	28	71						
Volume Right	0	16	0	71	74	9						
cSH	1183	1700	1415	1700	838	428						
Volume to Capacity	0.01	0.10	0.09	0.20	0.18	0.26						
Queue Length 95th (ft)	1	0	7	0	16	26						
Control Delay (s)	8.1	0.0	7.8	0.0	12.4	16.4						
Lane LOS	A		A		B	C						
Approach Delay (s)	0.6		2.0		12.4	16.4						
Approach LOS					B	C						
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization			43.1%		ICU Level of Service					A		
Analysis Period (min)			15									

Background Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1		1	1	
Volume (veh/h)	20	252	1	5	383	12	16	0	10	8	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	274	1	5	416	13	17	0	11	9	0	35
Pedestrians					2			8			6	
Lane Width (ft)						12.0		12.0			12.0	
Walking Speed (ft/s)						4.0		4.0			4.0	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	435			283			788	772	284	770	766	429
vC1, stage 1 conf vol							326	326		440	440	
vC2, stage 2 conf vol							462	446		330	326	
vCu, unblocked vol	435			283			788	772	284	770	766	429
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			96	100	99	98	100	94
cM capacity (veh/h)	1129			1282			469	484	753	504	495	627
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	22	275	5	429	28	43						
Volume Left	22	0	5	0	17	9						
Volume Right	0	1	0	13	11	35						
cSH	1129	1700	1282	1700	548	598						
Volume to Capacity	0.02	0.16	0.00	0.25	0.05	0.07						
Queue Length 95th (ft)	1	0	0	0	4	6						
Control Delay (s)	8.2	0.0	7.8	0.0	11.9	11.5						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.6		0.1		11.9	11.5						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization		32.0%			ICU Level of Service				A			
Analysis Period (min)			15									

Background Traffic Conditions
5: Theater Access & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

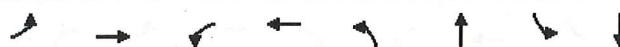
11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	917	119	0	897	88	0	0	57	0	0	88
Sign Control		Free				Free			Stop			Stop
Grade		0%				0%			0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	1054	137	0	1031	101	0	0	66	0	0	101
Pedestrians		26				1			1			1
Lane Width (ft)		12.0				12.0			12.0			12.0
Walking Speed (ft/s)		4.0				4.0			4.0			4.0
Percent Blockage		2				0			0			0
Right turn flare (veh)												
Median type		None				None						
Median storage veh												
Upstream signal (ft)						585						
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	1133				1192		1766	2257	597	1676	2274	593
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	884				1192		1601	2157	597	1500	2178	272
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				100		100	100	85	100	100	84
cM capacity (veh/h)	682				592		51	43	450	65	41	631
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	703	488	687	445	66	101						
Volume Left	0	0	0	0	0	0						
Volume Right	0	137	0	101	66	101						
cSH	1700	1700	1700	1700	450	631						
Volume to Capacity	0.41	0.29	0.40	0.26	0.15	0.16						
Queue Length 95th (ft)	0	0	0	0	13	14						
Control Delay (s)	0.0	0.0	0.0	0.0	14.4	11.8						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		14.4	11.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization		45.3%			ICU Level of Service				A			
Analysis Period (min)		15										

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	973	160	915	128	62	42	51
v/c Ratio	0.23	0.43	0.36	0.39	0.71	0.31	0.19	0.37
Control Delay	5.3	10.6	6.3	9.8	66.7	19.9	41.1	51.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	10.6	6.3	9.8	66.7	19.9	41.1	51.3
Queue Length 50th (ft)	18	171	28	154	90	6	27	31
Queue Length 95th (ft)	37	254	52	223	147	48	58	70
Internal Link Dist (ft)		505		1107		219		248
Turn Bay Length (ft)	200		325				200	
Base Capacity (vph)	509	2273	524	2348	180	413	232	357
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.43	0.31	0.39	0.71	0.15	0.18	0.14

Intersection Summary

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	46	52	764	112	144	814	10	115	7	49	38	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		1.7	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.87		1.00	0.97
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1788	3388		1787	3466			1719	1652		1805	1675
Flt Permitted	0.27	1.00		0.25	1.00			0.45	1.00		0.72	1.00
Satd. Flow (perm)	516	3388		462	3466			822	1652		1362	1675
Peak-hour factor, PHF	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	58	849	124	160	904	11	128	8	54	42	40
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	49	0	0	9
Lane Group Flow (vph)	0	108	967	0	160	915	0	128	13	0	42	42
Confl. Bikes (#/hr)				1			1					
Heavy Vehicles (%)	2%	0%	4%	6%	1%	4%	0%	5%	0%	0%	0%	12%
Turn Type	custom	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA
Protected Phases		5	2		1	6		3	8		7	4
Permitted Phases	5	2			6			8			4	
Actuated Green, G (s)	83.0	77.3		85.0	78.3		17.4	9.4		10.4	5.9	
Effective Green, g (s)	87.2	79.0		89.2	80.0		17.4	11.7		15.0	8.2	
Actuated g/C Ratio	0.73	0.66		0.74	0.67		0.14	0.10		0.12	0.07	
Clearance Time (s)	6.1	5.7		6.1	5.7		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	1.0	2.3		1.0	3.0		3.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	457	2230		440	2310		178	161		195	114	
v/s Ratio Prot	0.02	c0.29		c0.03	0.26		c0.05	0.01		0.01	0.02	
v/s Ratio Perm	0.16			0.24			c0.06			0.01		
v/c Ratio	0.24	0.43		0.36	0.40		0.72	0.08		0.22	0.37	
Uniform Delay, d1	5.2	9.8		5.4	9.1		47.6	49.3		47.0	53.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.2	0.5		13.0	0.1		0.2	0.7	
Delay (s)	5.3	9.9		5.6	9.6		60.6	49.3		47.2	54.1	
Level of Service	A	A		A	A		E	D		D	D	
Approach Delay (s)		9.4			9.0			56.9			51.0	
Approach LOS		A			A			E			D	
Intersection Summary												
HCM 2000 Control Delay	14.5									B		
HCM 2000 Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	120.0								16.0			
Intersection Capacity Utilization	55.7%									B		
Analysis Period (min)	15											
c Critical Lane Group												

Background Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour
11/23/2015

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Background Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↓		↑	↓		↑	↓	
Volume (veh/h)	72	91	89	10	88	62	119	37	3	76	46	170
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	85	107	105	12	104	73	140	44	4	89	54	200
Pedestrians		2			3			7				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type								TWLTL				None
Median storage veh)								2				
Upstream signal (ft)												299
pX, platoon unblocked												
vC, conflicting volume	783	665	163	726	763	48	256					50
vC1, stage 1 conf vol	335	335		328	328							
vC2, stage 2 conf vol	448	330		398	435							
vCu, unblocked vol	783	665	163	726	763	48	256					50
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1					4.1
tC, 2 stage (s)	6.2	5.5		6.1	5.5							
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2					2.2
p0 queue free %	71	76	88	96	73	93	89					94
cM capacity (veh/h)	290	449	878	281	386	1024	1318					1566
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	85	212	12	176	140	47	89	254				
Volume Left	85	0	12	0	140	0	89	0				
Volume Right	0	105	0	73	0	4	0	200				
cSH	290	592	281	520	1318	1700	1566	1700				
Volume to Capacity	0.29	0.36	0.04	0.34	0.11	0.03	0.06	0.15				
Queue Length 95th (ft)	30	40	3	37	9	0	5	0				
Control Delay (s)	22.4	14.4	18.4	15.4	8.1	0.0	7.4	0.0				
Lane LOS	C	B	C	C	A		A					
Approach Delay (s)	16.7		15.6		6.0		1.9					
Approach LOS	C		C									
Intersection Summary												
Average Delay			9.5									
Intersection Capacity Utilization			47.5%		ICU Level of Service				A			
Analysis Period (min)			15									

**APPENDIX F: YEAR 2016 TOTAL TRAFFIC CONDITIONS
WORKSHEETS**

Year 2016 Total Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday AM Peak Hour
11/23/2015



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	282	42	545	109	82	109	126
v/c Ratio	0.53	0.33	0.22	0.43	0.46	0.29	0.48	0.38
Control Delay	37.7	19.9	33.6	21.0	35.9	20.0	36.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	19.9	33.6	21.0	35.9	20.0	36.8	11.8
Queue Length 50th (ft)	44	82	14	83	37	16	37	6
Queue Length 95th (ft)	#134	192	50	166	103	53	103	45
Internal Link Dist (ft)		443		298		225		260
Turn Bay Length (ft)	100		175		100		200	
Base Capacity (vph)	357	990	354	1717	361	579	351	597
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.28	0.12	0.32	0.30	0.14	0.31	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Year 2016 Total Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1	1	1	1		1	1	
Volume (vph)	114	240	3	36	348	120	94	40	30	94	15	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	1.00		1.00	0.96		1.00	0.94		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1860		1703	3267		1736	1731		1687	1545	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1719	1860		1703	3267		1736	1731		1687	1545	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	133	279	3	42	405	140	109	47	35	109	17	109
RTOR Reduction (vph)	0	1	0	0	39	0	0	32	0	0	97	0
Lane Group Flow (vph)	133	281	0	42	506	0	109	50	0	109	29	0
Confl. Peds. (#/hr)	9		1	1		9			2	2		
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	5%	2%	0%	6%	6%	3%	4%	3%	0%	7%	7%	7%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.1	24.2		3.1	20.1		5.5	6.0		5.4	6.8	
Effective Green, g (s)	6.1	24.2		3.1	20.1		5.5	6.0		5.4	6.8	
Actuated g/C Ratio	0.10	0.39		0.05	0.32		0.09	0.10		0.09	0.11	
Clearance Time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Vehicle Extension (s)	2.6	2.1		2.9	2.1		2.7	1.6		2.4	1.6	
Lane Grp Cap (vph)	167	720		84	1050		152	166		145	168	
v/s Ratio Prot	c0.08	c0.15		0.02	c0.15		0.06	c0.03		c0.06	0.02	
v/s Ratio Perm												
v/c Ratio	0.80	0.39		0.50	0.48		0.72	0.30		0.75	0.17	
Uniform Delay, d1	27.6	13.8		28.9	17.0		27.7	26.3		27.9	25.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.0	0.2		4.4	0.2		14.3	0.4		18.5	0.2	
Delay (s)	49.6	14.0		33.3	17.2		42.1	26.7		46.3	25.5	
Level of Service	D	B		C	B		D	C		D	C	
Approach Delay (s)		25.4			18.3			35.5			35.2	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			25.4				HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			62.5				Sum of lost time (s)		24.9			
Intersection Capacity Utilization			47.3%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

Year 2016 Total Traffic Conditions
2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday AM Peak Hour
11/23/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖ ↗ ↘ ↗ ↖ ↘	↖ ↗ ↘ ↗ ↖ ↘	↖ ↗ ↘ ↗ ↖ ↘	↖ ↗ ↘ ↗ ↖ ↘	↖ ↗ ↘ ↗ ↖ ↘	↖ ↗ ↘ ↗ ↖ ↘
Volume (veh/h)	98	24	147	72	12	96
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	105	26	158	77	13	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	326	197		235		
vC1, stage 1 conf vol	197					
vC2, stage 2 conf vol	129					
vCu, unblocked vol	326	197		235		
tC, single (s)	6.4	6.2		4.1		
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3		2.2		
p0 queue free %	86	97		99		
cM capacity (veh/h)	774	850		1344		
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	105	26	235	13	103	
Volume Left	105	0	0	13	0	
Volume Right	0	26	77	0	0	
cSH	774	850	1700	1344	1700	
Volume to Capacity	0.14	0.03	0.14	0.01	0.06	
Queue Length 95th (ft)	12	2	0	1	0	
Control Delay (s)	10.4	9.4	0.0	7.7	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	10.2		0.0	0.9		
Approach LOS	B					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization		24.2%		ICU Level of Service		A
Analysis Period (min)		15				

Year 2016 Total Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1	1	1	1	
Volume (veh/h)	37	113	4	29	87	46	2	15	31	30	10	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	43	131	5	34	101	53	2	17	36	35	12	7
Pedestrians					2			3				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					0			0				
Right turn flare (veh)								2				
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)		1198										
pX, platoon unblocked												
vC, conflicting volume	155			139			397	445	139	442	420	128
vC1, stage 1 conf vol							223	223		195	195	
vC2, stage 2 conf vol							174	222		246	225	
vCu, unblocked vol	155			139			397	445	139	442	420	128
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.6		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	97			98			100	97	96	94	98	99
cM capacity (veh/h)	1420			1453			663	588	911	611	610	928
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	43	136	34	155	56	53						
Volume Left	43	0	34	0	2	35						
Volume Right	0	5	0	53	36	7						
cSH	1420	1700	1453	1700	1411	639						
Volume to Capacity	0.03	0.08	0.02	0.09	0.04	0.08						
Queue Length 95th (ft)	2	0	2	0	3	7						
Control Delay (s)	7.6	0.0	7.5	0.0	9.9	11.1						
Lane LOS	A		A		A	B						
Approach Delay (s)	1.8		1.3		9.9	11.1						
Approach LOS					A	B						
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			29.9%		ICU Level of Service					A		
Analysis Period (min)			15									

Year 2016 Total Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1			1	1		1	1
Volume (veh/h)	5	167	2	8	151	3	6	0	26	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	7	223	3	11	201	4	8	0	35	1	0	7
Pedestrians								4				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	205			229			471	468	228	495	467	203
vC1, stage 1 conf vol							241	241		225	225	
vC2, stage 2 conf vol							229	227		271	243	
vCu, unblocked vol	205			229			471	468	228	495	467	203
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	96	100	100	99
cM capacity (veh/h)	1378			1346			655	618	814	623	617	842
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	7	225	11	205	43	8						
Volume Left	7	0	11	0	8	1						
Volume Right	0	3	0	4	35	7						
cSH	1378	1700	1346	1700	778	796						
Volume to Capacity	0.00	0.13	0.01	0.12	0.05	0.01						
Queue Length 95th (ft)	0	0	1	0	4	1						
Control Delay (s)	7.6	0.0	7.7	0.0	9.9	9.6						
Lane LOS	A		A		A	A						
Approach Delay (s)	0.2		0.4		9.9	9.6						
Approach LOS					A	A						
Intersection Summary												
Average Delay				1.3								
Intersection Capacity Utilization			19.5%		ICU Level of Service				A			
Analysis Period (min)			15									

Year 2016 Total Traffic Conditions
5: Theater Access & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1010	60	0	662	14	0	0	35	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1074	64	0	704	15	0	0	37	0	0	4
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)					585							
pX, platoon unblocked	0.95						0.95	0.95		0.95	0.95	0.95
vC, conflicting volume	719			1138			1466	1826	569	1286	1850	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	591			1138			1380	1760	569	1190	1786	215
tC, single (s)	4.1			4.5			7.8	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	92	100	100	99
cM capacity (veh/h)	942			511			88	81	470	127	78	752
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	716	422	470	250	37	4						
Volume Left	0	0	0	0	0	0						
Volume Right	0	64	0	15	37	4						
cSH	1700	1700	1700	1700	470	752						
Volume to Capacity	0.42	0.25	0.28	0.15	0.08	0.01						
Queue Length 95th (ft)	0	0	0	0	6	0						
Control Delay (s)	0.0	0.0	0.0	0.0	13.3	9.8						
Lane LOS					B	A						
Approach Delay (s)	0.0		0.0		13.3	9.8						
Approach LOS					B	A						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization		39.8%		ICU Level of Service					A			
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour
11/23/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	1091	72	652	69	106	3	6
v/c Ratio	0.05	0.42	0.18	0.26	0.57	0.50	0.02	0.06
Control Delay	2.3	6.1	3.0	4.5	70.0	19.2	46.3	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.3	6.1	3.0	4.5	70.0	19.2	46.3	38.8
Queue Length 50th (ft)	2	124	5	63	53	2	2	1
Queue Length 95th (ft)	12	245	22	128	93	57	11	16
Internal Link Dist (ft)		505		1107		219		248
Turn Bay Length (ft)	200		325				200	
Base Capacity (vph)	722	2614	503	2504	122	439	157	355
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.42	0.14	0.26	0.57	0.24	0.02	0.02

Intersection Summary

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour

11/23/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	9	21	996	19	67	599	7	64	3	96	3	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		1.7	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00			1.00	0.85		1.00	0.90
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1793	3388		1703	3165			1514	1598		1799	1692
Flt Permitted	0.39	1.00		0.22	1.00			0.65	1.00		0.89	1.00
Satd. Flow (perm)	742	3388		401	3165			1028	1598		1684	1692
Peak-hour factor, PHF	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	10	23	1071	20	72	644	8	69	3	103	3	2
RTOR Reduction (vph)	0	0	1	0	0	0	0	0	94	0	0	4
Lane Group Flow (vph)	0	33	1090	0	72	652	0	69	12	0	3	2
Confl. Peds. (#/hr)		1		2	2		1	2		2	2	
Confl. Bikes (#/hr)				1			1					
Heavy Vehicles (%)	2%	0%	6%	18%	6%	14%	0%	19%	0%	0%	0%	0%
Turn Type	custom	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA
Protected Phases		5	2			1	6		3	8		7
Permitted Phases	5	2				6			8			4
Actuated Green, G (s)	88.0	85.0		90.4	86.2			12.7	7.8		3.1	2.2
Effective Green, g (s)	92.2	86.7		94.6	87.9			12.7	10.1		7.7	4.5
Actuated g/C Ratio	0.77	0.72		0.79	0.73			0.11	0.08		0.06	0.04
Clearance Time (s)	6.1	5.7		6.1	5.7			4.0	6.3		4.0	6.3
Vehicle Extension (s)	1.0	2.3		1.0	3.0			3.0	1.0		1.0	1.0
Lane Grp Cap (vph)	614	2447		384	2318			135	134		111	63
v/s Ratio Prot	0.00	c0.32		c0.01	0.21			c0.03	0.01		0.00	0.00
v/s Ratio Perm	0.04			0.14				c0.03			0.00	
v/c Ratio	0.05	0.45		0.19	0.28			0.51	0.09		0.03	0.03
Uniform Delay, d1	3.3	6.8		3.6	5.4			50.3	50.7		52.6	55.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.1		0.1	0.3			3.2	0.1		0.0	0.1
Delay (s)	3.3	6.9		3.7	5.7			53.5	50.8		52.7	55.7
Level of Service	A	A		A	A			D	D		D	E
Approach Delay (s)		6.8			5.5				51.9			54.7
Approach LOS		A			A				D			D
Intersection Summary												
HCM 2000 Control Delay		10.4								B		
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		120.0							16.0			
Intersection Capacity Utilization		52.8%								A		
Analysis Period (min)		15										
c Critical Lane Group												

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday AM Peak Hour
11/23/2015

Movement	SBR
Lane Configurations	
Volume (vph)	4
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	4
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Year 2016 Total Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday AM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1		1	1		1	1	0	1	1	1
Volume (veh/h)	116	35	41	1	10	8	43	39	0	8	13	67
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	141	43	50	1	12	10	52	48	0	10	16	82
Pedestrians					2			1				
Lane Width (ft)						12.0		12.0				
Walking Speed (ft/s)						4.0		4.0				
Percent Blockage						0		0				
Right turn flare (veh)												
Median type							TWLTL				None	
Median storage veh)								2				
Upstream signal (ft)											299	
pX, platoon unblocked												
vC, conflicting volume	245	231	58	262	272	50	98				50	
vC1, stage 1 conf vol	76	76		154	154							
vC2, stage 2 conf vol	168	154		108	117							
vCu, unblocked vol	245	231	58	262	272	50	98				50	
tC, single (s)	7.2	6.6	6.2	8.1	6.5	6.3	4.2				4.1	
tC, 2 stage (s)	6.2	5.6		7.1	5.5							
tF (s)	3.6	4.1	3.3	4.4	4.0	3.4	2.3				2.2	
p0 queue free %	81	94	95	100	98	99	96				99	
cM capacity (veh/h)	734	695	1013	542	684	990	1465				1567	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	141	93	1	22	52	48	10	98				
Volume Left	141	0	1	0	52	0	10	0				
Volume Right	0	50	0	10	0	0	0	82				
cSH	734	836	542	792	1465	1700	1567	1700				
Volume to Capacity	0.19	0.11	0.00	0.03	0.04	0.03	0.01	0.06				
Queue Length 95th (ft)	18	9	0	2	3	0	0	0				
Control Delay (s)	11.1	9.8	11.7	9.7	7.5	0.0	7.3	0.0				
Lane LOS	B	A	B	A	A		A					
Approach Delay (s)	10.6		9.8		4.0		0.7					
Approach LOS	B		A									
Intersection Summary												
Average Delay			6.8									
Intersection Capacity Utilization		29.1%			ICU Level of Service				A			
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
8: West Site Dwy & Site Dwy

Weekday AM Peak Hour

11/23/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	B	B			R
Volume (veh/h)	0	26	6	0	6	4
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	35	8	0	8	5
Pedestrians				4		
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	33	8			8	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	8			8	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	977	1080			1625	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	35	8	13			
Volume Left	0	0	8			
Volume Right	35	0	0			
cSH	1080	1700	1625			
Volume to Capacity	0.03	0.00	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.4	0.0	4.3			
Lane LOS	A		A			
Approach Delay (s)	8.4	0.0	4.3			
Approach LOS	A					
Intersection Summary						
Average Delay		6.3				
Intersection Capacity Utilization		15.5%		ICU Level of Service		A
Analysis Period (min)		15				

Year 2016 Total Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday PM Peak Hour
11/23/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	310	39	548	100	86	151	324
v/c Ratio	0.46	0.49	0.18	0.70	0.40	0.29	0.55	0.62
Control Delay	35.2	20.9	32.8	25.0	34.3	15.4	38.1	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	20.9	32.8	25.0	34.3	15.4	38.1	11.6
Queue Length 50th (ft)	39	67	13	80	34	10	50	14
Queue Length 95th (ft)	112	222	49	171	99	49	#171	90
Internal Link Dist (ft)		443		298		225		260
Turn Bay Length (ft)	100		175		100		200	
Base Capacity (vph)	387	996	398	1760	394	608	379	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.31	0.10	0.31	0.25	0.14	0.40	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Year 2016 Total Traffic Conditions
1: SW Langer Dr & SW Sherwood Blvd

Weekday PM Peak Hour
11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (vph)	109	282	12	37	367	154	95	28	54	143	43	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1868		1805	3328		1787	1678		1719	1640	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1868		1805	3328		1787	1678		1719	1640	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	115	297	13	39	386	162	100	29	57	151	45	279
RTOR Reduction (vph)	0	2	0	0	58	0	0	49	0	0	230	0
Lane Group Flow (vph)	115	308	0	39	490	0	100	37	0	151	94	0
Confl. Peds. (#/hr)	8				8			6	6			
Confl. Bikes (#/hr)			1		1							
Heavy Vehicles (%)	3%	1%	0%	0%	2%	4%	1%	0%	0%	5%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	5.5	19.0		2.0	14.4		5.2	8.4		6.3	10.4	
Effective Green, g (s)	5.5	19.0		2.0	14.4		5.2	8.4		6.3	10.4	
Actuated g/C Ratio	0.09	0.32		0.03	0.24		0.09	0.14		0.11	0.17	
Clearance Time (s)	6.7	5.2		5.8	5.4		5.9	6.0		6.8	6.0	
Vehicle Extension (s)	2.6	2.1		2.9	2.1		2.7	1.6		2.4	1.6	
Lane Grp Cap (vph)	161	596		60	805		156	236		182	286	
v/s Ratio Prot	c0.07	c0.16		0.02	0.15		0.06	0.02		c0.09	c0.06	
v/s Ratio Perm												
v/c Ratio	0.71	0.52		0.65	0.61		0.64	0.16		0.83	0.33	
Uniform Delay, d1	26.2	16.5		28.4	20.0		26.2	22.4		26.1	21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.3	0.4		22.0	0.9		8.1	0.1		25.1	0.2	
Delay (s)	39.5	16.9		50.4	21.0		34.3	22.6		51.2	21.7	
Level of Service	D	B		D	C		C	C		D	C	
Approach Delay (s)		23.0			22.9			28.9			31.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		25.9				HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		59.5				Sum of lost time (s)			24.9			
Intersection Capacity Utilization		65.2%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												

Year 2016 Total Traffic Conditions
2: SW Langer Dr & Dwy North Of Dutch Bros

Weekday PM Peak Hour
11/23/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑		↑	↑
Volume (veh/h)	148	17	146	93	13	306
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	157	18	155	99	14	326
Pedestrians	3					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			340			
pX, platoon unblocked						
vC, conflicting volume	561	211			257	
vC1, stage 1 conf vol	208					
vC2, stage 2 conf vol	353					
vCu, unblocked vol	561	211			257	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.3	
p0 queue free %	76	98			99	
cM capacity (veh/h)	645	830			1270	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	157	18	254	14	326	
Volume Left	157	0	0	14	0	
Volume Right	0	18	99	0	0	
cSH	645	830	1700	1270	1700	
Volume to Capacity	0.24	0.02	0.15	0.01	0.19	
Queue Length 95th (ft)	24	2	0	1	0	
Control Delay (s)	12.4	9.4	0.0	7.9	0.0	
Lane LOS	B	A		A		
Approach Delay (s)	12.1		0.0	0.3		
Approach LOS	B					
Intersection Summary						
Average Delay		2.9				
Intersection Capacity Utilization		31.5%		ICU Level of Service		A
Analysis Period (min)		15				

Year 2016 Total Traffic Conditions
3: 99W RIRO Access & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Volume (veh/h)	13	138	15	112	253	68	26	44	69	69	31	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	14	148	16	120	272	73	28	47	74	74	33	9
Pedestrians						6			2			
Lane Width (ft)						12.0			12.0			
Walking Speed (ft/s)						4.0			4.0			
Percent Blockage						1			0			
Right turn flare (veh)									2			
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)		1198										
pX, platoon unblocked												
vC, conflicting volume	345			167			716	772	164	793	744	309
vC1, stage 1 conf vol							186	186		549	549	
vC2, stage 2 conf vol							530	586		243	194	
vCu, unblocked vol	345			167			716	772	164	793	744	309
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			91			93	89	92	82	92	99
cM capacity (veh/h)	1181			1415			419	423	879	402	438	736
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	165	120	345	149	116						
Volume Left	14	0	120	0	28	74						
Volume Right	0	16	0	73	74	9						
cSH	1181	1700	1415	1700	837	427						
Volume to Capacity	0.01	0.10	0.09	0.20	0.18	0.27						
Queue Length 95th (ft)	1	0	7	0	16	27						
Control Delay (s)	8.1	0.0	7.8	0.0	12.5	16.6						
Lane LOS	A		A		B	C						
Approach Delay (s)	0.6		2.0		12.5	16.6						
Approach LOS					B	C						
Intersection Summary												
Average Delay			5.3									
Intersection Capacity Utilization		43.4%			ICU Level of Service				A			
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
4: West Site Dwy & SW Langer Dr

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑			↑			↑	
Volume (veh/h)	20	252	4	27	383	12	18	0	21	8	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	274	4	29	416	13	20	0	23	9	0	35
Pedestrians					2			8			6	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	435			286			837	822	286	830	817	429
vC1, stage 1 conf vol							328	328		488	488	
vC2, stage 2 conf vol							510	494		342	330	
vCu, unblocked vol	435			286			837	822	286	830	817	429
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			98			96	100	97	98	100	94
cM capacity (veh/h)	1129			1279			438	458	751	463	465	627
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	22	278	29	429	42	43						
Volume Left	22	0	29	0	20	9						
Volume Right	0	4	0	13	23	35						
cSH	1129	1700	1279	1700	565	586						
Volume to Capacity	0.02	0.16	0.02	0.25	0.08	0.07						
Queue Length 95th (ft)	1	0	2	0	6	6						
Control Delay (s)	8.2	0.0	7.9	0.0	11.9	11.6						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.6		0.5		11.9	11.6						
Approach LOS					B	B						
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization		34.4%			ICU Level of Service					A		
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
5: Theater Access & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑↑			↑↑
Volume (veh/h)	0	927	119	0	902	88	0	0	57	0	0	88
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	1066	137	0	1037	101	0	0	66	0	0	101
Pedestrians		26			1			1			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)					585							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	1139			1203			1780	2274	603	1688	2292	596
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	891			1203			1618	2177	603	1513	2197	275
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	85	100	100	84
cM capacity (veh/h)	678			587			50	41	446	63	40	628
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	710	492	691	447	66	101						
Volume Left	0	0	0	0	0	0						
Volume Right	0	137	0	101	66	101						
cSH	1700	1700	1700	1700	446	628						
Volume to Capacity	0.42	0.29	0.41	0.26	0.15	0.16						
Queue Length 95th (ft)	0	0	0	0	13	14						
Control Delay (s)	0.0	0.0	0.0	0.0	14.5	11.8						
Lane LOS					B	B						
Approach Delay (s)	0.0		0.0		14.5	11.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization		45.4%			ICU Level of Service				A			
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour
11/23/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	985	171	915	133	68	42	51
v/c Ratio	0.23	0.44	0.39	0.39	0.74	0.33	0.19	0.37
Control Delay	5.3	10.9	6.6	9.8	69.4	19.4	41.1	51.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	10.9	6.6	9.8	69.4	19.4	41.1	51.3
Queue Length 50th (ft)	18	175	30	154	93	6	27	31
Queue Length 95th (ft)	37	265	56	223	#152	49	58	70
Internal Link Dist (ft)		505		1107		219		248
Turn Bay Length (ft)	200		325				200	
Base Capacity (vph)	509	2259	516	2348	180	417	232	357
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.44	0.33	0.39	0.74	0.16	0.18	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour

11/23/2015

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	46	52	764	122	154	814	10	120	7	54	38	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	1.7	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	1.00	0.98		1.00	1.00		1.00	0.87	1.00	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1788	3381		1787	3466		1719	1649		1805	1675	
Flt Permitted	0.28	1.00		0.24	1.00		0.45	1.00		0.71	1.00	
Satd. Flow (perm)	518	3381		452	3466		822	1649		1354	1675	
Peak-hour factor, PHF	0.92	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	58	849	136	171	904	11	133	8	60	42	40
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	54	0	0	9
Lane Group Flow (vph)	0	108	978	0	171	915	0	133	14	0	42	42
Confl. Bikes (#/hr)				1			1					
Heavy Vehicles (%)	2%	0%	4%	6%	1%	4%	0%	5%	0%	0%	0%	12%
Turn Type	custom	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA
Protected Phases		5	2			1	6		3	8		7 4
Permitted Phases	5	2			6			8				4
Actuated Green, G (s)	82.7	77.0		85.3	78.3		17.4	9.4		10.4	5.9	
Effective Green, g (s)	86.9	78.7		89.5	80.0		17.4	11.7		15.0	8.2	
Actuated g/C Ratio	0.72	0.66		0.75	0.67		0.14	0.10		0.12	0.07	
Clearance Time (s)	6.1	5.7		6.1	5.7		4.0	6.3		4.0	6.3	
Vehicle Extension (s)	1.0	2.3		1.0	3.0		3.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	457	2217		438	2310		178	160		194	114	
v/s Ratio Prot	0.02	c0.29		c0.03	0.26		c0.05	0.01		0.01	0.02	
v/s Ratio Perm	0.16			0.26			c0.06			0.01		
v/c Ratio	0.24	0.44		0.39	0.40		0.75	0.09		0.22	0.37	
Uniform Delay, d1	5.3	10.0		5.5	9.1		47.8	49.3		47.0	53.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.2	0.5		15.7	0.1		0.2	0.7	
Delay (s)	5.4	10.1		5.7	9.6		63.5	49.4		47.2	54.1	
Level of Service	A	B		A	A		E	D		D	D	
Approach Delay (s)		9.6			9.0			58.7			51.0	
Approach LOS		A			A			E			D	
Intersection Summary												
HCM 2000 Control Delay	14.9											B
HCM 2000 Volume to Capacity ratio	0.49											
Actuated Cycle Length (s)	120.0											16.0
Intersection Capacity Utilization	56.9%											B
Analysis Period (min)	15											
c Critical Lane Group												

Year 2016 Total Traffic Conditions
6: SW Baler Way & SW Tualatin-Sherwood Rd

Weekday PM Peak Hour
11/23/2015

Movement	SBR
Lane Configurations	
Volume (vph)	10
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	11
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	1
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Year 2016 Total Traffic Conditions
7: SW Baler Way & SW Langer Dr

Weekday PM Peak Hour
11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	2	3	4	5	6	7	8	9	10	11	12
Volume (veh/h)	82	91	90	10	88	62	121	37	3	76	46	190
Sign Control	Stop				Stop			Free			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	96	107	106	12	104	73	142	44	4	89	54	224
Pedestrians		2				3			7			
Lane Width (ft)		12.0				12.0			12.0			
Walking Speed (ft/s)		4.0				4.0			4.0			
Percent Blockage		0				0			1			
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage veh								2				
Upstream signal (ft)											299	
pX, platoon unblocked	1.00	1.00	1.00	1.00	1.00			1.00				
vC, conflicting volume	800	681	175	732	791	48	280				50	
vC1, stage 1 conf vol	347	347		333	333							
vC2, stage 2 conf vol	453	335		399	458							
vCu, unblocked vol	796	678	169	729	788	48	274				50	
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.2	5.5		6.1	5.5							
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	66	76	88	96	72	93	89				94	
cM capacity (veh/h)	285	443	867	276	372	1024	1293				1566	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2				
Volume Total	96	213	12	176	142	47	89	278				
Volume Left	96	0	12	0	142	0	89	0				
Volume Right	0	106	0	73	0	4	0	224				
cSH	285	585	276	505	1293	1700	1566	1700				
Volume to Capacity	0.34	0.36	0.04	0.35	0.11	0.03	0.06	0.16				
Queue Length 95th (ft)	36	41	3	39	9	0	5	0				
Control Delay (s)	23.9	14.6	18.6	15.9	8.1	0.0	7.4	0.0				
Lane LOS	C	B	C	C	A		A					
Approach Delay (s)	17.5		16.1		6.1		1.8					
Approach LOS	C		C									
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization		48.9%		ICU Level of Service				A				
Analysis Period (min)		15										

Year 2016 Total Traffic Conditions
8: West Site Dwy & Site Dwy

Weekday PMPeak Hour
11/23/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Volume (veh/h)	0	13	26	0	25	6
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	14	28	0	27	7
Pedestrians	2		8			6
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	99	36			30	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	99	36			30	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			98	
cM capacity (veh/h)	882	1035			1593	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	14	28	34			
Volume Left	0	0	27			
Volume Right	14	0	0			
cSH	1035	1700	1593			
Volume to Capacity	0.01	0.02	0.02			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	8.5	0.0	5.9			
Lane LOS	A		A			
Approach Delay (s)	8.5	0.0	5.9			
Approach LOS	A					
Intersection Summary						
Average Delay		4.2				
Intersection Capacity Utilization		20.2%		ICU Level of Service		A
Analysis Period (min)		15				